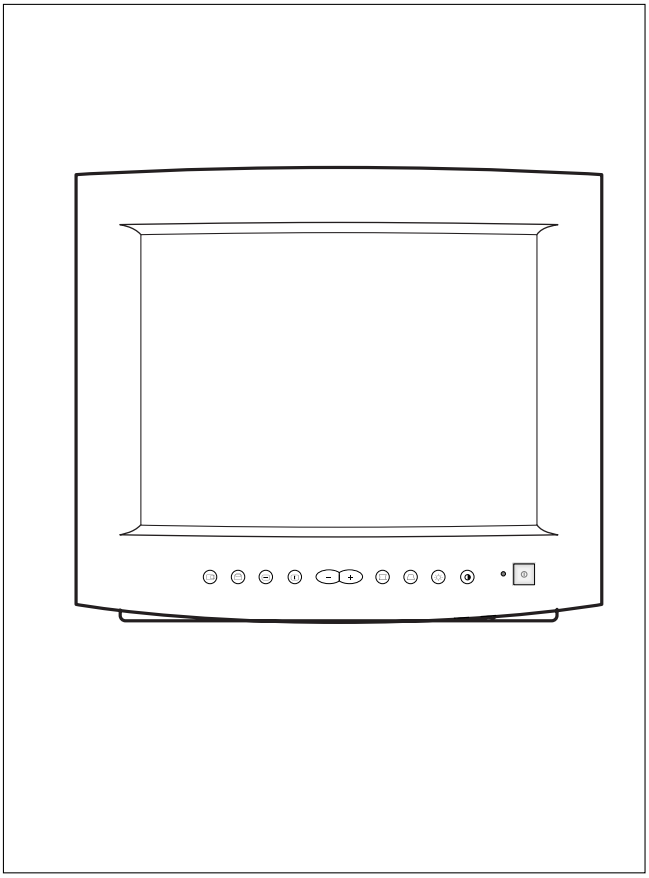
# COLOR MONITOR

**DP14LS**
**DP14LT**
**DP15LS**
**DP15LT**

# SERVICE Manual

## COLOR MONITOR



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# 1 Precautions

## 1-1 Safety Precautions

**WARNINGS**

1. For continued safety, do not attempt to modify the circuit board.
2. Disconnect the AC power before servicing.
3. When the chassis is operating, semiconductor heatsinks are potential shock hazards.

### 1-1-1 Servicing the High Voltage VR and CRT :

**WARNING: Damaged IC202 may cause excessive x-ray emissions.**

1. When servicing the high voltage system, remove the static charge by connecting a 10 kohm resistor in series with an insulated wire (such as a test probe) between the chassis and the anode lead.
2. If the HV VR requires adjustment:
   This monitor does not need to adjust high voltage, high voltage step is saved at IC202, adjusting this high voltage to 24.5±0.5 kV - 14", 25.0±0.5 kV - 15".
3. When troubleshooting a monitor with excessively HV, avoid being unnecessarily close to the monitor. Do not operate the monitor for longer than is necessary to locate the cause of excessive voltage.
4. High voltage should always be kept at the rated value, no higher. Only when high voltage is excessive are X-rays capable of penetrating the shell of the CRT, including the lead in glass material. Operation at high voltages may also cause failure of the CRT or high voltage circuitry.
5. When the HV regulator is operating properly, there is no possibility of an X-ray problem. Make sure the HV does not exceed its specified value and that it is regulating correctly.
6. The CRT is especially designed to prohibit X-ray emissions. To ensure continued X-ray protection, replace the CRT only with one that is the same or equivalent type as the original.
7. Handle the CRT only when wearing shatterproof goggles and after completely discharging the high voltage anode.
8. Do not lift the CRT by the neck.

### 1-1-2 Fire and Shock Hazard :

Before returning the monitor to the user, perform the following safety checks:

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.
3. Leakage Current Hot Check (Figure 1-1):
   **WARNING: Do not use an isolation transformer during this test.**
   Use a leakage current tester or a metering system that complies with American National Standards Institute (*ANSI C101.1, Leakage Current for Appliances*), and Underwriters Laboratories (*UL Publication UL1410, 59.7*).
4. With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat the test.

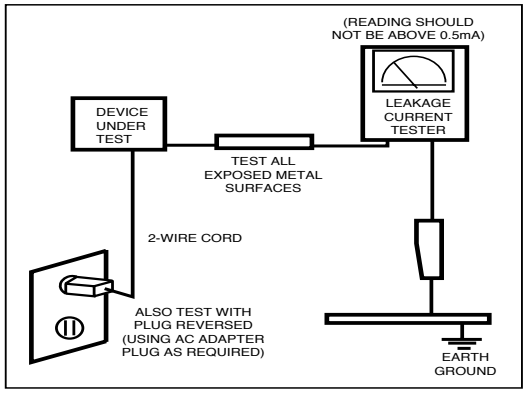

(READING SHOULD NOT BE ABOVE 0.5mA)
LEAKAGE CURRENT TESTER
DEVICE UNDER TEST
TEST ALL EXPOSED METAL SURFACES
2-WIRE CORD
ALSO TEST WITH PLUG REVERSED (USING AC ADAPTER PLUG AS REQUIRED)
EARTH GROUND

Figure 1-1. Leakage Current Test Circuit

### 1-1-4 Product Safety Notices

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schematics and parts lists. A substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and / or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

Components identified by ☢ on schematics and parts lists must be sealed by a soldering iron after replacement and adjustment.

## 1-2 Servicing Precautions

**WARNING1: First read the "Safety Precautions" section of this manual. If unforeseen circumstances create conflict between the servicing precautions and safety precautions, always follow the safety precautions.**

**WARNING2: An electrolytic capacitor installed with the wrong polarity might explode.**

1. Servicing precautions are printed on the cabinet, and should be followed closely.
2. Always unplug the unit's AC power cord from the AC power source before attempting to: (a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect all test components in parallel with an electrolytic capacitor.
3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.
5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
6. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to the blades of the AC plug.

   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
7. Never defeat any of the +B voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
8. Always connect a test instrument's ground lead to the instrument chassis ground *before* connecting the positive lead; always remove the instrument's ground lead last.

## 1-3 Electrostatically Sensitive Devices (ESD) Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   **Caution:** Be sure no power is applied to the chassis or circuit and observe all other safety precautions.
8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.
9. ⚠ Indicates ESDs on the Schematic Diagram in this manual.

# 2 Product Specifications

## 2-1 Specifications

| Item | Description | |
|---|---|---|
| Picture Tube: | 14-Inch (36 cm); 13.2-Inch (33.5 cm) viewable, 90° Deflection,<br>15-Inch (38 cm); 13.8-Inch (35 cm) viewable, flat-face tube, 90° Deflection,<br>0.28 mm Dot pitch, Semi-tint, Non-glare, Antistatic silica coating, Invar shadow mask | |
| Scanning Frequency | Horizontal: 30 kHz to 55 kHz (Automatic) - 14" / 30 kHz to 61 kHz (Automatic) - 15"<br>Vertical: 50 Hz to 120 Hz (Automatic) | |
| Display Colors | Unlimited colors | |
| Maximum Resolution | Horizontal : 1024 Dots<br>Vertical : 768 Lines | |
| Input Video Signal | Analog, 0.7 Vp-p positive at 75 Ω, internally terminated | |
| Input Sync Signal | Separate Sync : TTL level positive/negative | |
| Maximum Pixel Clock | 14" : 65 MHz, 15" : 80 MHz | |
| Active Display | 14" | 15" |
| Horizontal<br>Vertical | 255 mm ± 4 mm (4:3 ratio)<br>191 mm ± 4 mm | 267 mm ± 4 mm (4:3 ratio)<br>200 mm ± 4 mm |
| Input Voltage | AC 90 to 264 Volts, 60 Hz/50 Hz ± 3 Hz | |
| Power Consumption | 75 Watt (Max.) | |
| Dimensions | 14" | 15" |
| Unit (W x D x H)<br>Carton (W x D x H) | 13.70 x 14.65 x 14.49 Inches (348 x 372 x 368 mm)<br>16.61 x 18.11 x 15.35 Inches (422 x 460 x 390 mm) | 14.25 x 15.12 x 15.12 Inches (362 x 384 x 384 mm)<br>17.87 x 19.57 x 17.52 Inches (454 x 497 x 445 mm) |
| Weight (Net/Gross) | 14" : 23.4 lbs (10.6 kg) / 26.9 lbs (12.2 kg)<br>15" : 26.5 lbs (12.0 kg) / 31.5 lbs (14.3 kg) | |
| Environmental Considerations | Operating Temperature : 32°F to 104°F (0°C to 40°C)<br>Humidity : 10 % to 80 %<br>Storage Temperature : -4°F to 113°F (-20°C to 45°C)<br>Humidity : 5 % to 95 % | |

- This above Models complies with SWEDAC (MPR II) recommendations for reduced electromagnetic fields.
- Designs and specifications are subject to change without prior notice.

## 2-2 Pin Assignments

| Sync Type / Pin No. | 15-Pin Signal Cable Connector (Figure 2-1) |
|---|---|
| | Separate |
| 1 | Red |
| 2 | Green |
| 3 | Blue |
| 4 | GND |
| 5 | DDC Return |
| 6 | GND-R |
| 7 | GND-G |
| 8 | GND-B |
| 9 | Reserved |
| 10 | GND-Sync/Self-raster |
| 11 | GND |
| 12 | DDC Data |
| 13 | H-Sync |
| 14 | V-Sync |
| 15 | DDC Clock |

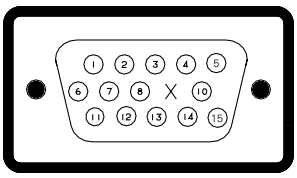


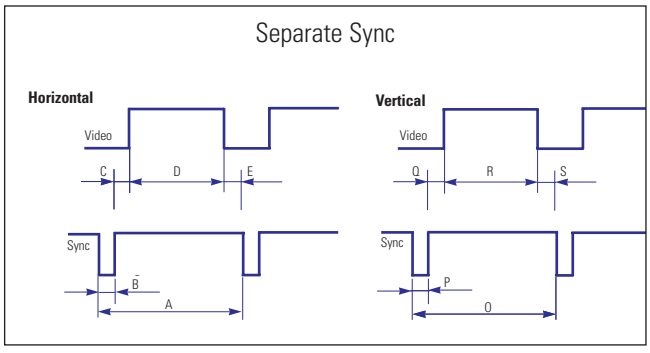

Figure 2-1. Male Type

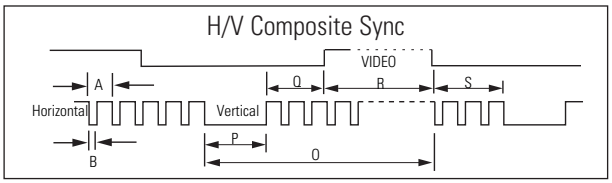
## 2-3 Timing Chart

This section of the service manual describes the timing that the computer industry recognizes as standard for computer-generated video signals.

Table 2-1. Timing Chart

| Mode / Timing | IBM | | VESA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 720/70 Hz 720 x 400 | 640/60 Hz 640 x 480 | 640/75 Hz 640 x 480 | 640/85 Hz 640 x 480 | 800/75 Hz 800 x 600 | 800/85 Hz 800 x 600 | 1024/60 Hz 1024 x 768 (14") | 1024/75 Hz 1024 x 768 (15") |
| fH (kHz) | 31.469 | 31.469 | 37.500 | 43.269 | 46.875 | 53.674 | 48.363 | 60.023 |
| A µsec | 31.777 | 31.778 | 26.667 | 23.111 | 21.333 | 18.631 | 20.677 | 16.660 |
| B µsec | 3.813 | 3.813 | 2.032 | 1.556 | 1.616 | 1.138 | 2.092 | 13.003 |
| C µsec | 1.907 | 1.907 | 3.810 | 2.222 | 3.232 | 2.702 | 2.462 | 3.658 |
| D µsec | 25.422 | 25.422 | 20.317 | 17.778 | 16.162 | 14.222 | 15.754 | 13.206 |
| E µsec | 0.636 | 0.636 | 0.508 | 1.556 | 0.323 | 0.569 | 0.369 | 3.454 |
| fV (Hz) | 70.087 | 59.940 | 75.000 | 85.008 | 75.000 | 85.061 | 60.004 | 75.029 |
| O msec | 14.268 | 16.683 | 13.333 | 11.764 | 13.333 | 11.756 | 16.666 | 13.328 |
| P msec | 0.064 | 0.064 | 0.080 | 0.069 | 0.064 | 0.056 | 0.124 | 12.795 |
| Q msec | 1.080 | 1.048 | 0.427 | 0.578 | 0.448 | 0.503 | 0.600 | 0.533 |
| R msec | 12.711 | 15.253 | 12.800 | 11.093 | 12.800 | 11.179 | 15.880 | 12.812 |
| S msec | 0.413 | 0.318 | 0.027 | 0.023 | 0.021 | 0.019 | 0.062 | 0.516 |
| Clock Frequency (MHz) | 28.322 | 25.175 | 31.500 | 36.000 | 49.500 | 56.250 | 65.000 | 78.750 |
| Polarity H.Sync | Negative | Negative | Negative | Negative | Positive | Positive | Negative | Positive |
| V.Sync | Positive | Negative | Negative | Negative | Positive | Positive | Negative | Positive |
| Remark | Separate | Separate | Separate | Separate | Separate | Separate | Separate | Separate |




| | | | |
|---|---|---|---|
| A : Line time total | B : Horizontal sync width | O : Frame time total | P : Vertical sync width |
| C : Back porch | D : Active time | Q : Back porch | R : Active time |
| E : Front porch | | S : Front porch | |

## Memo

# 3 Operating Instructions

## 3-1 Front View and Control

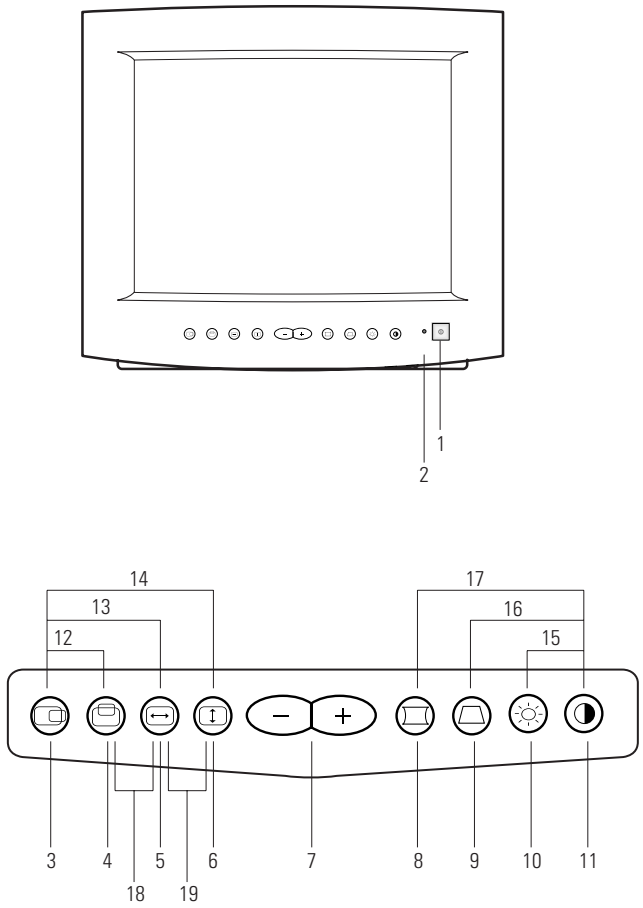



Figure 3-1. Front Control Panel

Table 3-1. Front Panel Controls

| Location | Symbol | Description |
|---|---|---|
| 1 | | Power Button |
| 2 | | Power Indicator LED |
| 3 | | Horizontal Position Button |
| 4 | | Vertical Position Button |
| 5 | | Horizontal Size Button |
| 6 | | Vertical Size Button |
| 7 | | Adjustment Buttons |
| 8 | | Side Pincushion Button |
| 9 | | Trapezoid Button |
| 10 | | Brightness Control |
| 11 | | Contrast Control |
| 12 | + | Parallelogram |
| 13 | + | V-Linearity |
| 14 | + | Pinbalance Button |
| 15 | + | Degauss |
| 16 | + | Recall |
| 17 | + | User Delete |
| 18 | + | Tilt (Option: 15") |
| 19 | + | V-Moire |

# Memo

# 4 Disassembly and Reassembly

This section of the service manual describes the disassembly and reassembly procedures for the DP14L*/DP15L* monitors.

**WARNING: This monitor contains electrostatically sensitive devices. Use caution when handling these components.**

## 4-1 Disassembly

**Cautions:** 1. Disconnect the monitor from the power source before disassembly.
2. To remove the Rear Cover, you must use the special opening jig tool.

### 4-1-1 Cabinet Disassembly

1. With a pad beneath it, stand the monitor on its front with the screen facing downward and the base closest to you. Make sure nothing will damage the screen.
2. Remove the Stand from the monitor. (Refer to Stand manual)
3. Incline the monitor by lifting the rear of the monitor.

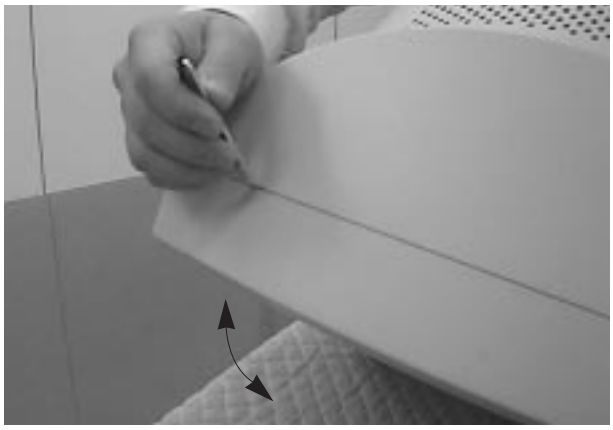


Figure 1

4. Push the Opening jig each groove along the top of the monitor till it makes a "ttak" sound. (2 grooves : Left and Right, Make sure each snap is disengaged.)

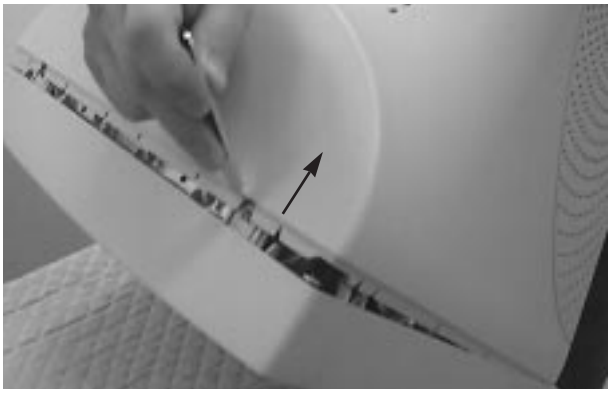


Figure 2

5. Squeeze the hold-snap on bottom of the monitor using your hand.

Figure 3

6. Insert the Opening jig into the groove then release the hold-snap.

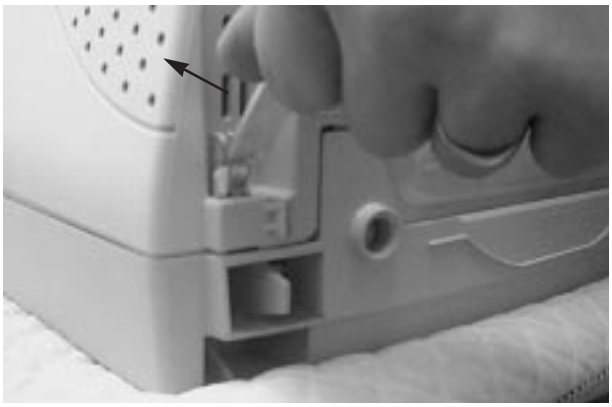


Figure 4

7. When the hold-snap release, lift the Rear Cover slightly to make sure it doesn't re-engage while you release the snap on the other side.

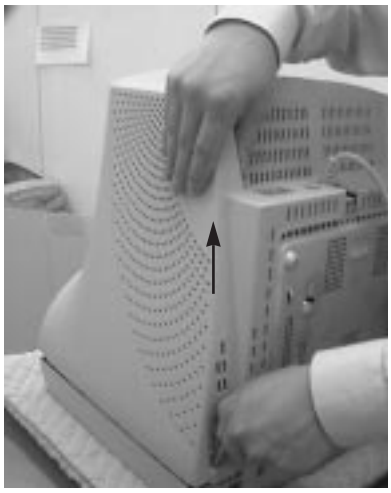


Figure 5

8. In a similar manner, Release the hold-snap on the opposite side.
9. Pull the Rear Cover up off the monitor.

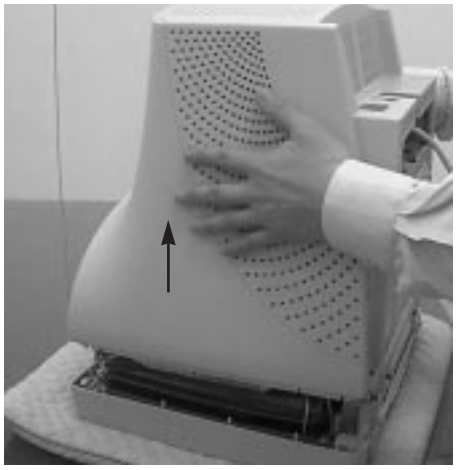


Figure 6

10. Using pinch-nose pliers or ling-nose pliers, acrefully disconnect the Anode Cap from the CRT.

**Warning:** **Do not touch the Anode contact on the CRT (High Voltage may remain).**

**Note :** If the hold-snap on the bottom of the Front Cover is broken, secure the cabinet by applying a 4x16 screw in the extra holes on each side of the cabinet.

Figure 7

Figure 8

### 4-1-2 Removing the CRT Socket PCB

1. Complete all previous steps.
2. Disconnect the CRT and Main PCB ground wires between the CRT Socket PCB and Shield Cover. (DP14LS only)
3. Lift up the Video Spring and remove the CRT Socket PCB from the CRT.

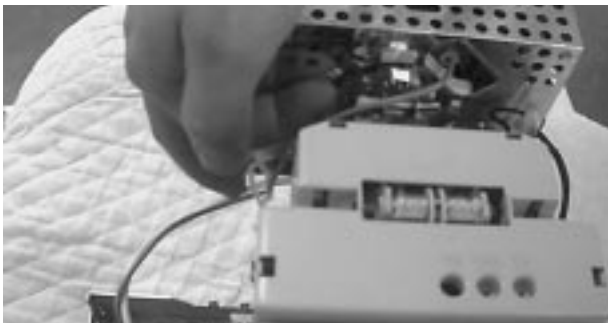


Figure 9

4. Disconnect all connectors on the CRT Socket PCB.
5. Using a solder iron, disconnect Ground (G2) on the back of the Video Shield and remove the Shield Cap.
6. Remove the screw on the front of the Shield Socket.
7. Desolder the 4 tabs on the CRT Socket PCB and remove Shield.
8. Place the Video PCB on a flat, level surface that is protected from static electricity.

### 4-1-3 Removing the Main PCB

1. Complete all previous steps.
2. Disconnect the Degaussing Coil at GT601 and GT602 on the Main PCB.
3. Disconnect all easily accessible ground wires on the Main PCB and Bottom Chassis.
4. Disconnect the DY connector at the CN303 connector on the Main .
5. Using the jig, release the snaps (2) connecting the Front Cover and Main PCB then lift up the Bottom to separate the two Shield.

Figure 10

6. Remove the screws on the back and along each side of the Bottom Chassis.
7. Carefully lift the Main PCB Ass'y and remove the remaining ground wires.
8. Place the Main PCB Ass'y on a flat, level surface that is protected from static electricity.

### 4-1-4 CRT Ass'y Disassembly

1. Complete all previous steps.
2. Straighten the Degaussing Coil Assembly coated metal ties and lift the Coil Ass'y from the CRT.
3. Remove the four corner screws and lift the CRT up and away from the Front Cover Assembly and place it on a padded surface.

**Caution:** Do not lift the CRT by the neck.

If you will be returning this CRT to the monitor, be sure to place the CRT face downward on a protective pad.

## 4-2 Reassembly

Reassembly procedures are in the reverse order of Disassembly procedures.

## Memo

# 5 Alignment and Adjustments

This section of the service manual explains how to make permanent adjustments to the monitor. Directions are given for adjustments using the monitor Interface Board Ver. 2.0 and software (Softjig).

## 5-1 Adjustment Conditions

**Caution:** Changes made without the SoftJig are saved only to the user mode settings. As such, the settings are not permanently stored and may be inadvertently deleted by the user.

### 5-1-1 Before Making Adjustments

5-1-1 (a) ORIENTATION

When servicing, always face the monitor to the east.

5-1-1 (b) MAGNETIC FIELDS

Whenever possible, use magnetic field isolation equipment such as a Helmholtz field to surround the monitor. If a Helmholtz field is not available, frequently degauss the unit under test.

**Caution:** Other electrical equipment may cause external magnetic fields which may interfere with monitor performance.

Use an external degaussing coil to limit magnetic build up on the monitor. If an external degaussing coil is not available, use the internal degaussing circuit. However, do not use the internal degaussing circuit more than once per 30 minutes.

5-1-1 (c) WARM-UP TIME

The monitor must be on for 30 minutes before starting alignment procedures. Warm-up time is especially critical in Color Temperature and White Balance adjustments.

5-1-1 (d) SIGNAL

Analog, 0.7 Vp-p positive at 75 ohm, internal termination
Sync: Separate
(TTL level negative/positive)

5-1-1 (e) SCANNING FREQUENCY

| | |
|---|---|
| Horizontal: | 30 kHz to 55 kHz (automatic) 14″ |
| | 30 kHz to 61 kHz (automatic) 15″ |
| Vertical: | 50 Hz to 120 Hz (automatic) |

Unless otherwise specified, adjust at the 800 x 600 mode (H : 53.7 kHz, V: 85 Hz) -14″/15″ signals.

Refer to Table on page 2-3.

5-1-1 (f) +B 13 V LINE CHECK

No beam
Contrast: Maximum
Brightness: Maximum

Check the DC 13 V ± 0.2 V at Cathode of D616 Point and GND.

5-1-1 (g) HIGH VOLTAGE CHECK

No beam
Contrast: Maximum
Brightness: Maximum

Check the high voltage to 24.5 ± 0.5 kV - 14″, 25 ± 0.5 kV - 15″ at anode and GND.

5-1-1 (h) CENTER RASTER

Adjust VR501 so that the back raster comes to the center when you apply a signal of 60 kHz/75 Hz - 15″ .

5-1-1 (i) BRIGHTNESS AND CONTRAST

Unless otherwise specified, adjust brightness and contrast buttons:

Brightness: Maximum
(press ⊕ button until the LED is blink)
Contrast: Maximum
(press ⊕ button until the LED is blink)

### 5-1-2 Required Equipment

The following equipment may be necessary for adjustment procedures:

5-1-2 (a) DISPLAY CONTROL ADJUSTMENT

1. Non-metallic (–) screwdriver: 1.5 mm
   Non-metallic (–) screwdriver: 3 mm
2. Philips (+) screwdriver: 1.5 mm
3. Non-metallic hexkey: 2.5 mm
4. Digital Multimeter (DMM), or
   Digital Voltmeter (DVM)

5. Signal generator, or
   Computer with a video board that uses the ET-4000 chipset (strongly recommended if using Samsung DM 200 software) and that displays: 800 x 600 @ 85 Hz, or 800 x 600 @ 75 Hz (minimum).
6. Personal computer
7. Required software: Softjig.exe from Samsung, Samsung DM200, or DisplayMate for Windows from Sonera Technologies
8. Interface Board Ver. 2.0 Code No. BH81-90001K
9. Parallel communications cable (25-pin to 25-pin); Code No. BH81-90001H
10. Signal cable (15-pin to 15-pin cable with additional 3-pin connector); Code No. BH81-90001J
11. 5 V DC adapter, not supplied

**Note:** SoftJig Assembly (includes items 8, 9 and 10 Code No. BH81-90001L

5-1-2 (b) COLOR ADJUSTMENTS

1. All equipment listed in 5-1-2 (a), above
2. Color analyzer, or any luminance measurement equipment

### 5-1-3 Connecting the SoftJig

Connect the monitor to the signal generator and/or PC as illustrated in Figures 5-1 and 5-2.

**Note:** The signal cable connector which includes the 3-wire cable must connect to the monitor. If you use Setup 2 (PC only, no signal generator) you can only make adjustments to the signal timing available on that computer system. To make corrections to all factory timings requires the use of an additional signal generator.

### 5-1-4 After Making Adjustments

After finishing all adjustments, test the monitor in all directions. If, for example, the monitor does not meet adjustment specifications when facing north, reposition the monitor to face east and readjust. This time, try for an adjustment closer to the ideal setting within the tolerance range. Test the unit again in all directions. If the monitor again fails to meet specifications in every direction, contact your Regional After Service Center for possible CRT replacement.

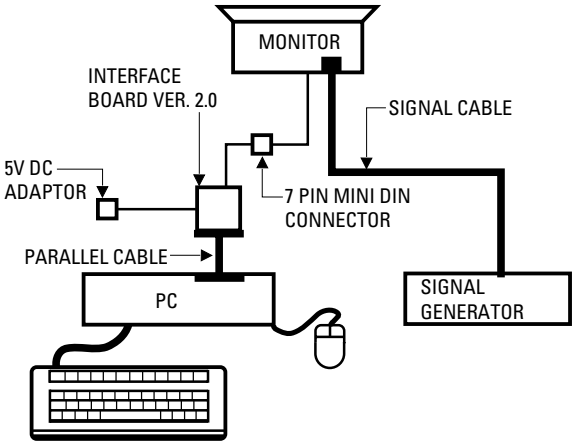



Figure 5-1. Setup 1, With Signal Generator

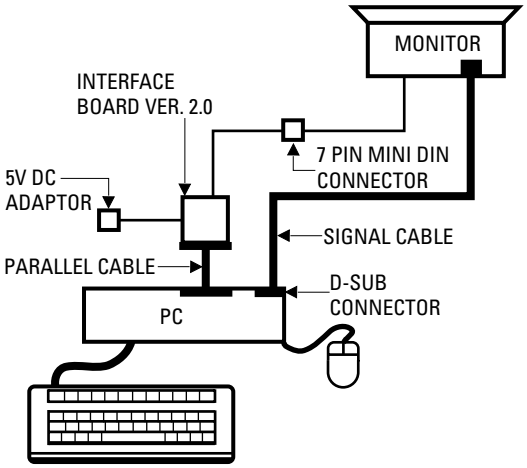



Figure 5-2. Setup 2, Without Signal Generator

# 5-2 Display Control Adjustments

## 5-2-1 Centering

Centering means to position the center point of the display in the middle of the display area. Horizontal size and position and vertical size and position control the centering of the display.

Adjust the horizontal size and vertical size to their optimal settings: 267 mm (H) x 200 mm (V) for 15″, 255 mm (H) x 191 mm (V) for 14″

Adjust the horizontal position and vertical position to within 4.0 mm of the center point of the screen.

l A - B l ≤ 5.0 mm.
l C - D l ≤ 5.0 mm.

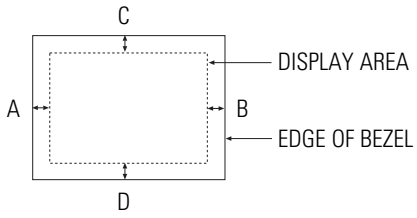



Figure 5-3. Centering

5-2-1 (a) HORIZONTAL MINIMUM SIZE ADJUSTMENT

CONDITIONS

| | |
|---|---|
| Scanning frequency: | 53.7 kHz/85 Hz |
| Display image: | Crosshatch pattern |
| Brightness: | Maximum |
| Contrast: | Maximum |

PROCEDURE

Horizontal minimum size can be adjusted as follows using Softjig.

1. Display the timing 800 x 600/85 Hz.
2. Adjust horizontal size to minimum size using H_SIZE.
3. Adjust horizontal minimum size to 250 mm (15″) or 242 mm (14″) using H_SIZE MIN.
4. Adjust horizontal size to 267 mm (15″) or 255 mm (14″) using H_SIZE.
5. Press the ALL MODE SAVE horizontal minimum size for each timing is saved automatically.

If horizontal minimum size range cannot meet the spec, horiontal maximum size of 640 x 480/75 Hz including 800 x 600/60 Hz, 56 Hz, may be saturated or cannot overscan the bezel.

5-2-1 (b) VERTICAL SIZE ADJUSTMENT

CONDITIONS

| | |
|---|---|
| Scanning frequency: | 53.7 kHz/85 Hz |
| Display image: | Crosshatch pattern |
| Brightness: | Maximum |
| Contrast: | Maximum |

Adjust the vertical size of the display pattern to 200 mm (15″) and 191 mm (14″).
(Tolerance: ± 3 mm.)

5-2-1 (c) HORIZONTAL POSITION ADJUSTMENT

CONDITIONS

| | |
|---|---|
| Scanning frequency: | 53.7 kHz/85 Hz |
| Display image: | Crosshatch pattern |

PROCEDURE

Center the test pattern on the raster.

5-2-1 (d) VERTICAL POSITION ADJUSTMENT

CONDITIONS

| | |
|---|---|
| Scanning frequency: | 53.7 kHz/85 Hz |
| Display image: | Crosshatch pattern |

Center the test pattern on the raster.

## 5-2-2 Linearity

Linearity affects the symmetry of images as they appear on the screen. Unless each row or column of blocks in a crosshatch pattern is of equal size, or within the tolerances shown in Tables 5-1 and 5-2, an image appears distorted, elongated or squashed.

The formular of linearity (%)

$$= \frac{2 \times (\text{Max} - \text{Min})}{\text{Max} + \text{Min}} \times 100$$

Table 5-1. Standard Modes Linearity: 800 x 600/85Hz

| | Standard Timing Modes | |
|---|---|---|
| | Each block (10 %) | Difference between adjacent blocks (4 %) |

Table 5-2. Other Modes Linearity: VGA, SVGA, XGA, MAC, etc.

| | Supported Timing Mode | |
|---|---|---|
| | Each block (14 %) | Difference between adjacent blocks (5 %) |

### 5-2-3 Trapezoid Adjustment

CONDITIONS

Scanning frequency: 53.7 kHz/85 Hz
Display image: Crosshatch pattern

Make the the test pattern rectangular.

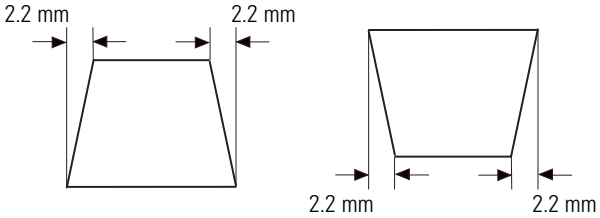



Figure 5-4. Trapezoid

### 5-2-4 Parallelogram Adjustment

CONDITIONS

Scanning frequency: 53.7 kHz/85 Hz (14"/15")
Display image: Crosshatch pattern

To activate the Parallelogram Adjustment function, push both the Horizontal Position and Vertical Position buttons and hold them in for longer than 3 seconds, or until the power indicator LED changes from green to blink and back to green.

Use the Increase (+) and Decrease (–) buttons to correct the display shape.

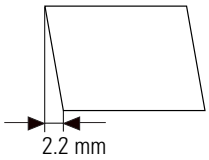



Figure 5-5. Parallelogram

### 5-2-5 Side Pincushion Adjustment

CONDITIONS

Scanning frequency: 53.7 kHz/85 Hz (14"/15")
Display image: Crosshatch pattern

After pushing the Side Pincushion button once, push the Increase (+) and Decrease (–) buttons to straighten the sides of the test pattern.

$| C1 |, | C2 | \leq 2.0$ mm, $| D1 |, | D2 | \leq 2.2$ mm.

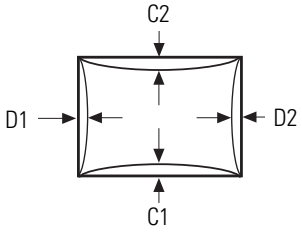



Figure 5-6. Pincushion

### 5-2-6 CRT Tilt Adjustment ( Option)

TILT ADJUSTMENT (DP15L* With Tilt)

Push the V-Posi and H-Size simultaneously until Led blinks and back on again. Push the Increase (+) and Decrease (–) buttons to correct the Tilt.

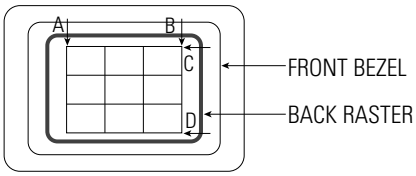



Figure 5-7. CRT Tilt Adjustment

### 5-2-7 Vertical Linearity Adjustment

To activate the vertical linearity adjustment, push both the horizontal position and horizontal size buttons and hold then in for longer than 3 seconds, or until the power indicator LED changes from green to blink and back to green.

Use the Increase (+) and Decrease (–) buttons to correct the display shape.

### 5-2-8 Pin Balance Adjustments

To activate the pin balacne function, push both the horizontal position and vertical Size buttons and hold then in for longer than 3 seconds, or until the power indicator LED changes from green to blink and back to green.

Use the Increase (+) and Decrease (–) buttons to correct the display shape.

### 5-2-9 Degauss

Push the contrast and brightness buttons simultaneously. The degaussing circuit can effectively function only once per 30 minutes. If available, use an external degaussing coil during servicing.

### 5-2-10 Delete User Mode Data

To delete the picture data from the user modes, push the contrast button and side pincushion button for 5 or more seconds simultaneously.

### 5-2-11 Recall

To delete the picture data from current user mode, push the contrast button and trapzoid button for 5 or more seconds simultaneoulsy.

## 5-3 Color Adjustments

Before making adjustments, check that the video signals are as follows:

Video : Analog, 0.7 Vp-p (at 75 Ω termination)
Sync : Separate TTL level
Unless otherwise specified, use 800 x 600 mode signal (53.7 kHz/85 Hz) for adjustments.

### 5-3-1 Color Coordinates (Temperature)

Color temperature is a measurement of the radiant energy transmitted by a color. For computer monitors, the color temperature refers to the radiant energy transmitted by white. Color coordinates are the X and Y coordinates on the chromaticity diagram of wavelengths for the visible spectrum.

CONDITIONS

| | |
|---|---|
| Measurement instrument: | Color analyzer |
| Scanning frequency: | 53.7 kHz/85 Hz |
| Display image: | White flat field at center of display area |
| Luminance: | Maximum |

PROCEDURE

Using the directions in sections 5-3-2 through 5-3-5, adjust the Color Coordinates for 9300K to x = 0.283 ± 0.02 and y = 0.298 ± 0.02

### 5-3-2 Back Raster Color Adjustment

CONDITIONS

| | |
|---|---|
| Measurement instrument: | Color analyzer |
| Scanning frequency: | 53.7 kHz/85 Hz |
| Display image: | Back raster pattern |
| Brightness: | Maximum |
| Contrast: | Maximum |

PROCEDURE

1. Adjust the Screen VR on the FBT so that the brightness of the Back Raster is 0.3 to 0.5 ft-L (typically 0.4 ft-L).
2. Adjust the G_CUT to center.
3. Adjust the B_CUT to set the "y" coordinate to 0.298 ± 0.02.
4. Adjust the R_CUT to set the "x" coordinate to 0.283 ± 0.02.

**Note:** If the above adjustments cannot be done to each coordinate, adjust G_CUT to increase or decrease the green cutoff and repeat procedures 3 and 4.

### 5-3-3 Video Gain Adjustment

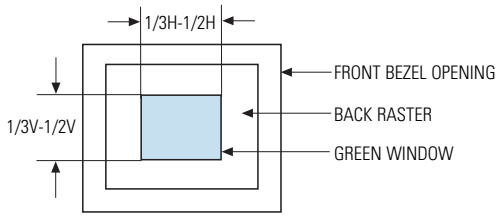



Figure 5-8. Green Box Pattern

CONDITIONS

| | |
|---|---|
| Measurement instrument: | Color analyzer |
| Scanning frequency: | 53.7 kHz/85 Hz |
| Display image: | Green box pattern within range for which the ABL circuit is not active (1/3 to 1/2H and 1/3 to 1/2V). |
| Brightness: | Maximum |
| Contrast: | Maximum |

PROCEDURE

1. Adjust G-Gain so that the brightness of the green gain is 40 ± 1 ft-L (typically 40 ft-L).

### 5-3-4 White Balance Adjustment

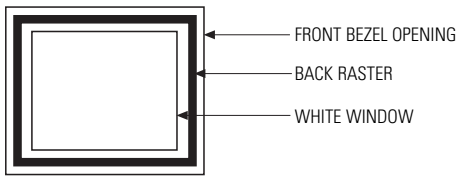



Figure 5-9. Full White Pattern

CONDITIONS

| | |
|---|---|
| Measurement instrument: | Color analyzer |
| Scanning frequency: | 53.7 kHz/85 Hz |
| Display image: | Full white pattern |
| Brightness: | Maximum |
| Contrast: | Maximum |

PROCEDURE

1. Display the full white pattern.
2. Adjust R-Gain and B-Gain so that the video is white.
(x = 0.283 ± 0.02 and y = 0.298 ± 0.02)

### 5-3-5 White Balance Fine Adjustment

CONDITIONS

| | |
|---|---|
| Measurement instrument: | Color analyzer |
| Scanning frequency: | 53.7 kHz/85 Hz |
| Display image: | Full white pattern |
| X-Y coordinates: | x = 0.283 ± 0.02 |
| | y = 0.298 ± 0.02 |

PROCEDURE

1. Adjust the Contrast control so that the brightness of the video is about 5 ft-L.
2. Check whether the white coordinates of the video meet the specification above. If they do not, adjust them so that they do.
3. Adjust the Contrast to maximum luminance.
4. Check whether the white coordinates still meet the specification above. If they do not, adjust them so that they do.

### 5-3-6 ABL Point Adjustment

CONDITIONS

| | |
|---|---|
| Measurement instrument: | Color analyzer |
| Scanning frequency: | 53.7 kHz/85 Hz |
| Display image: | Full white pattern |
| Brightness: | Maximum |
| Contrast: | Maximum |

PROCEDURE

Adjust ABL so that the brightness level is 35 ± 1 ft-L.

### 5-3-7 Focus Adjustment

CONDITIONS

| | |
|---|---|
| Measurement instrument: | Color analyzer |
| Scanning frequency: | 53.7 kHz/85 Hz |
| Display image: | "H" character pattern |
| Brightness: | Maximum |
| Contrast: | Maximum |

PROCEDURE

1. Adjust the Focus VR on the FBT to display the sharpest image possible.
2. Use Locktite to seal the Focus VR in position.

### 5-3-8 Luminance Uniformity Check

CONDITIONS

| | |
|---|---|
| Measurement instrument: | Color analyzer |
| Scanning frequency: | 53.7 kHz/85 Hz |
| Display image: | White flat field |
| Brightness: | Cut off point at 30 ft-L |

PROCEDURE

Measure luminance at nine points on the display screen: top left corner, top center, top right corner, center row left side, center, center row right side, bottom left corner, bottom center, and bottom right corner.

### 5-3-9 Color Purity Adjustment

Color purity is the absence of undesired color. Conspicuous mislanding (unexpected color in a uniform field) within the display area shall not be visible at a distance of 50 cm from the CRT surface.

CONDITIONS

| | |
|---|---|
| Orientation: | Monitor facing east |
| Scanning frequency: | 53.7 kHz/85 Hz |
| Display image: | White flat field |
| Luminance: | Cutoff point at the center of the display area |

**Caution:** Color purity adjustments should only be attempted by qualified personnel.

PROCEDURE

**For trained and experienced service technicians only.**

Use the following procedure to correct minor color purity problems:

1. Make sure the display is not affected by external magnetic fields. Use an external degaussing coil to neutralize magnetic fields which may be affecting color purity.
2. Very carefully break the glue seal between the 2-pole purity convergence magnets (PCM), the band and the spacer .
3. Make sure the spacing between the PCM assembly and the CRT stem is 22.5 mm ± 1 mm.
4. Display a red pattern over the entire display area.
5. Adjust the Purity Magnet Rings on the PCM assembly to display a pure green pattern. (Optimal setting: x = x = 0.283 ± 0.02, y = 0.298 ± 0.02)
6. Repeat steps 4 and 5 using a red pattern and then again, using a blue pattern.

Table 5-3. Color Purity Tolerances

| | | |
|---|---|---|
| Red: | x = 0.625 ± 0.015 | y = 0.340 ± 0.015 |
| Green: | x = 0.310 ± 0.015 | y = 0.592 ± 0.015 |
| Blue: | x = 0.150 ± 0.015 | y = 0.063 ± 0.015 |

(For 9300K white color adjustment: x = 0.283 ± 0.02, y = 0.298 ± 0.02)

7. When you have the PCMs properly adjusted, carefully gule them together with Locktite to prevent their movement during shipping.

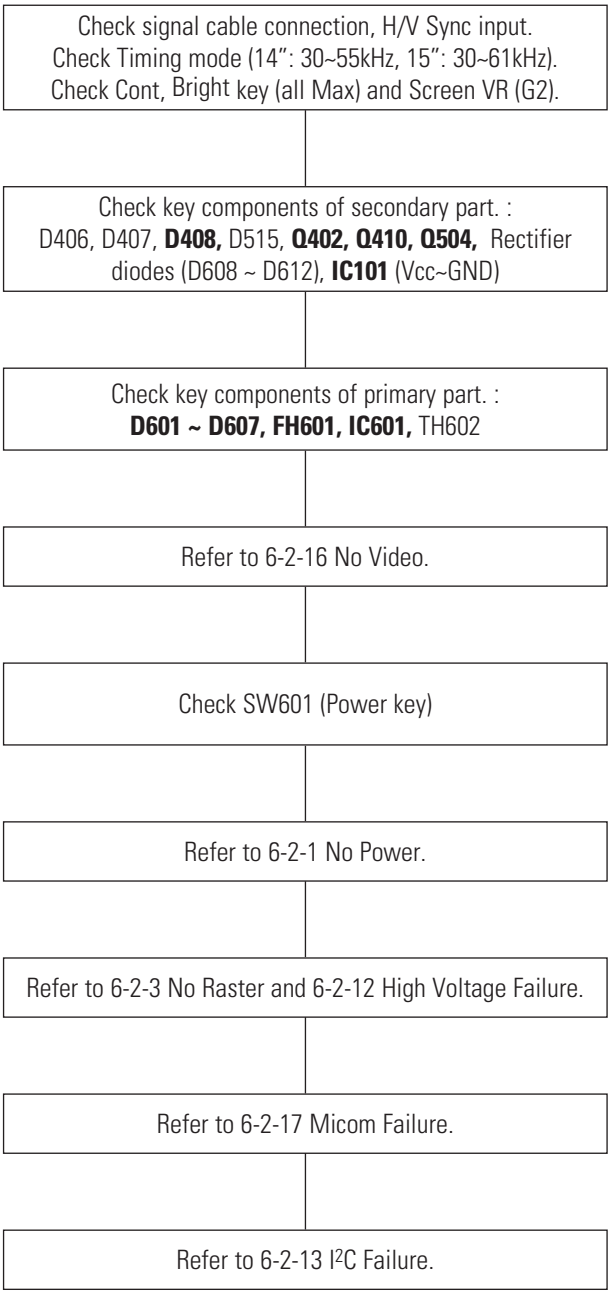
# 6 Troubleshooting

## 6-1 General Troubleshooting

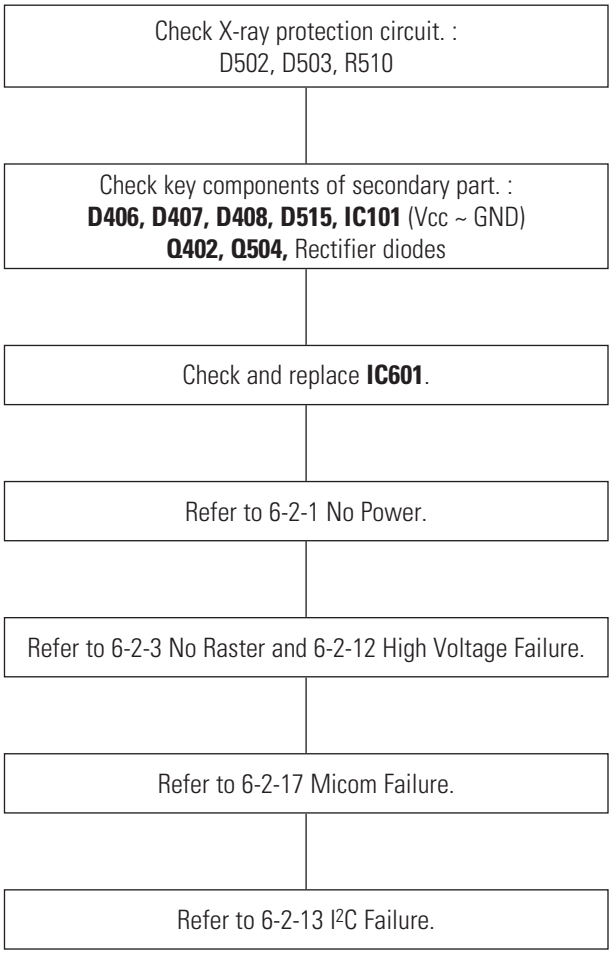
**Notes:** 1. If a picture does not appear, fully rotate the brightness and contrast controls clockwise and reinspect.

2. Check the following circuits.
   - No raster appears: Power circuit, Horizontal output circuit, H/V control circuit, and H/V output circuit.
   - High voltage develops but no raster appears: Video output circuits.
   - High voltage does not develop: Horizontal output circuits.

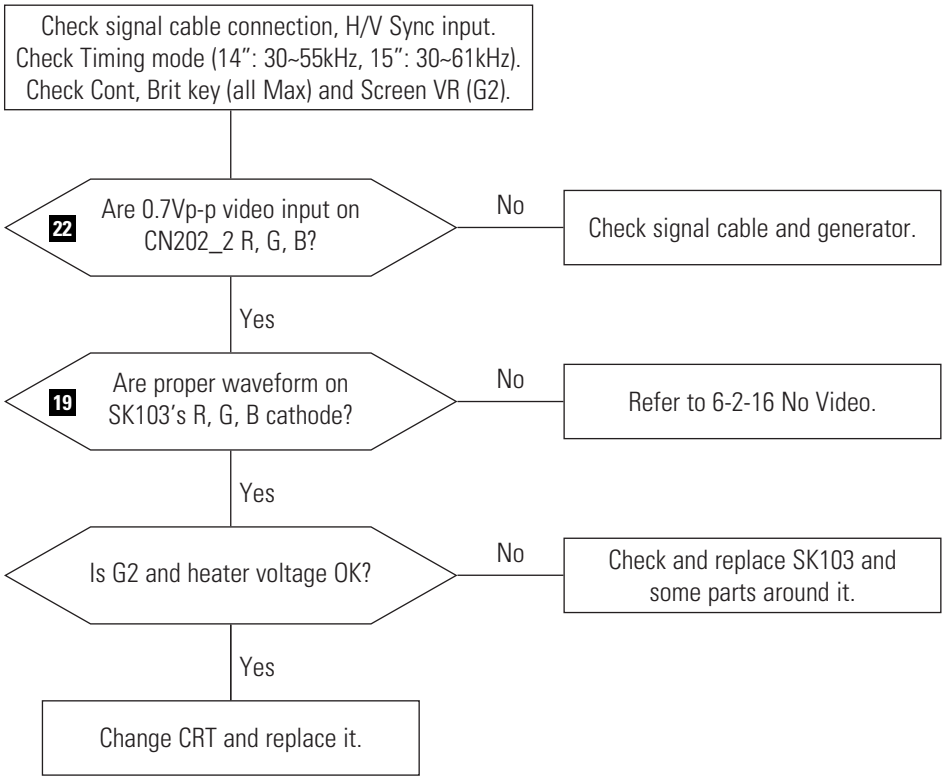
### 6-1-1 No Picture


Check signal cable connection, H/V Sync input.
Check Timing mode (14": 30~55kHz, 15": 30~61kHz).
Check Cont, Bright key (all Max) and Screen VR (G2).
Check key components of secondary part. :
D406, D407, **D408,** D515, **Q402, Q410, Q504,** Rectifier diodes (D608 ~ D612), **IC101** (Vcc~GND)
Check key components of primary part. :
**D601 ~ D607, FH601, IC601,** TH602
Refer to 6-2-16 No Video.
Check SW601 (Power key)
Refer to 6-2-1 No Power.
Refer to 6-2-3 No Raster and 6-2-12 High Voltage Failure.
Refer to 6-2-17 Micom Failure.
Refer to 6-2-13 I2C Failure.

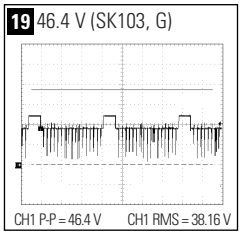
## 6-1-2 Shut Down

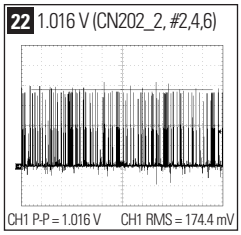

Check X-ray protection circuit. :
D502, D503, R510
Check key components of secondary part. :
**D406, D407, D408, D515, IC101** (Vcc ~ GND)
**Q402, Q504,** Rectifier diodes
Check and replace **IC601**.
Refer to 6-2-1 No Power.
Refer to 6-2-3 No Raster and 6-2-12 High Voltage Failure.
Refer to 6-2-17 Micom Failure.
Refer to 6-2-13 I2C Failure.

## 6-1-3 No Video or Missing Colors

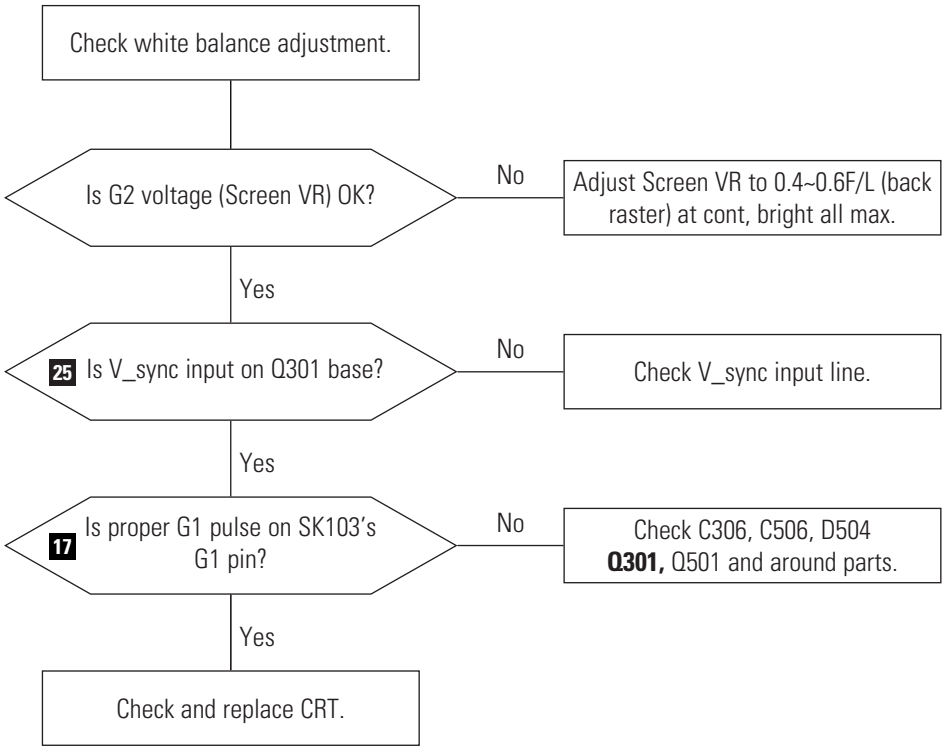

Check signal cable connection, H/V Sync input.
Check Timing mode (14": 30~55kHz, 15": 30~61kHz).
Check Cont, Brit key (all Max) and Screen VR (G2).
22 Are 0.7Vp-p video input on CN202_2 R, G, B?
No
Check signal cable and generator.
Yes
19 Are proper waveform on SK103's R, G, B cathode?
No
Refer to 6-2-16 No Video.
Yes
Is G2 and heater voltage OK?
No
Check and replace SK103 and some parts around it.
Yes
Change CRT and replace it.

**WAVEFORMS**

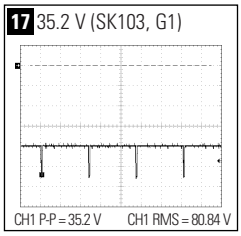


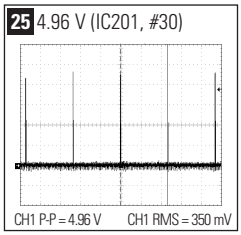




## 6-1-4 Visible Retrace

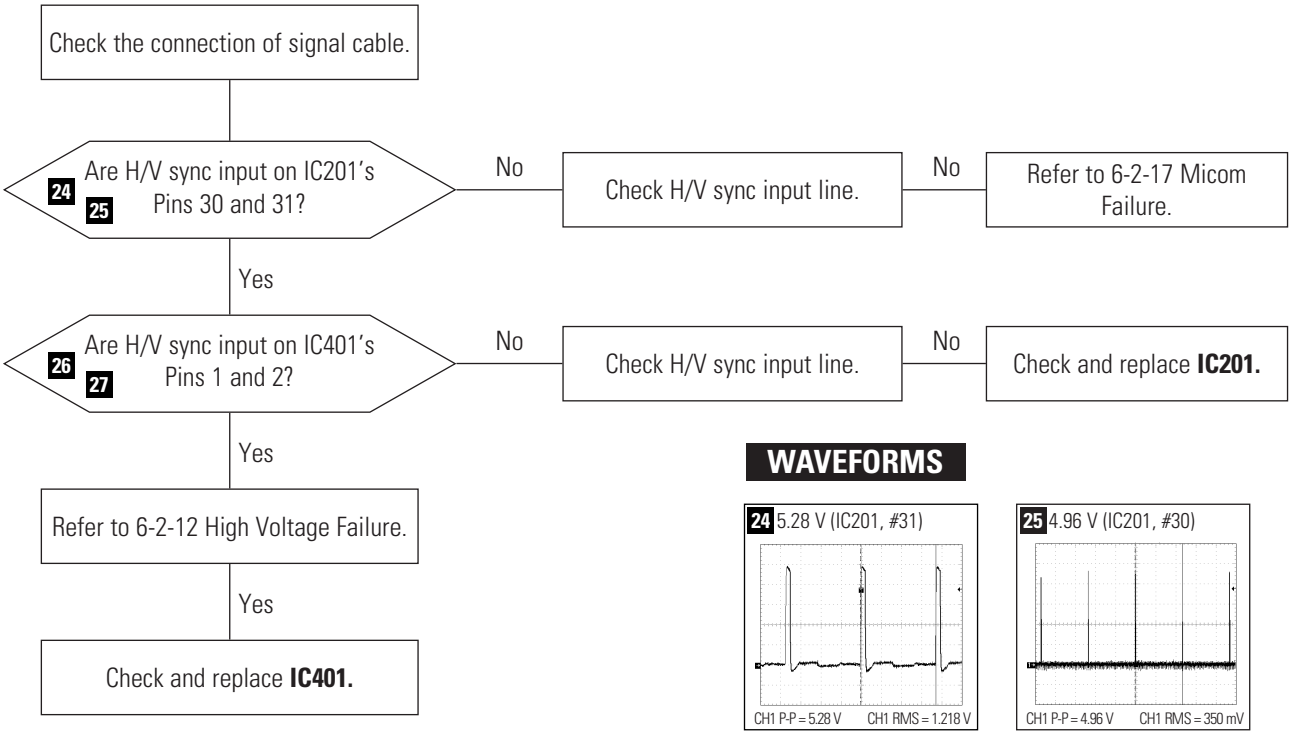

Check white balance adjustment.
Is G2 voltage (Screen VR) OK?
No
Adjust Screen VR to 0.4~0.6F/L (back raster) at cont, bright all max.
Yes
25 Is V_sync input on Q301 base?
No
Check V_sync input line.
Yes
17 Is proper G1 pulse on SK103's G1 pin?
No
Check C306, C506, D504 Q301, Q501 and around parts.
Yes
Check and replace CRT.

**WAVEFORMS**



## 6-1-5 Unsynchronized image

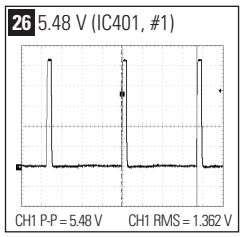

Check the connection of signal cable.
24 25 Are H/V sync input on IC201's Pins 30 and 31?
No
Check H/V sync input line.
No
Refer to 6-2-17 Micom Failure.
Yes
26 27 Are H/V sync input on IC401's Pins 1 and 2?
No
Check H/V sync input line.
No
Check and replace IC201.
Yes
Refer to 6-2-12 High Voltage Failure.
Yes
Check and replace IC401.

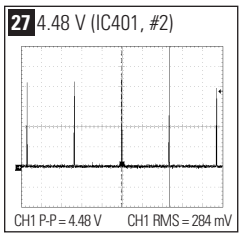
**WAVEFORMS**



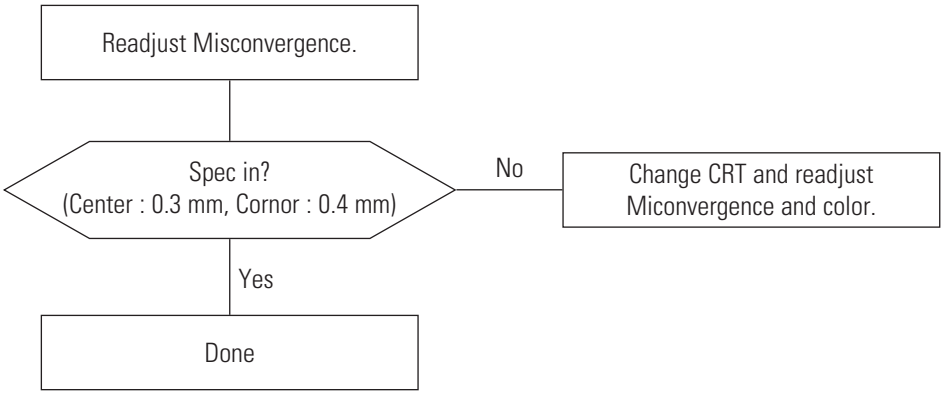




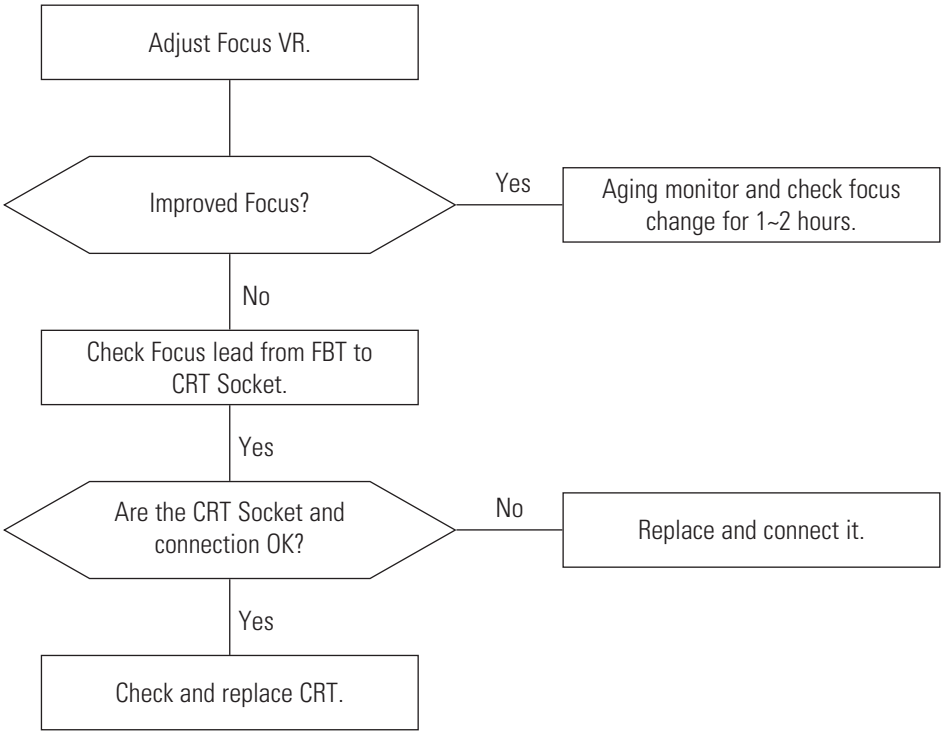


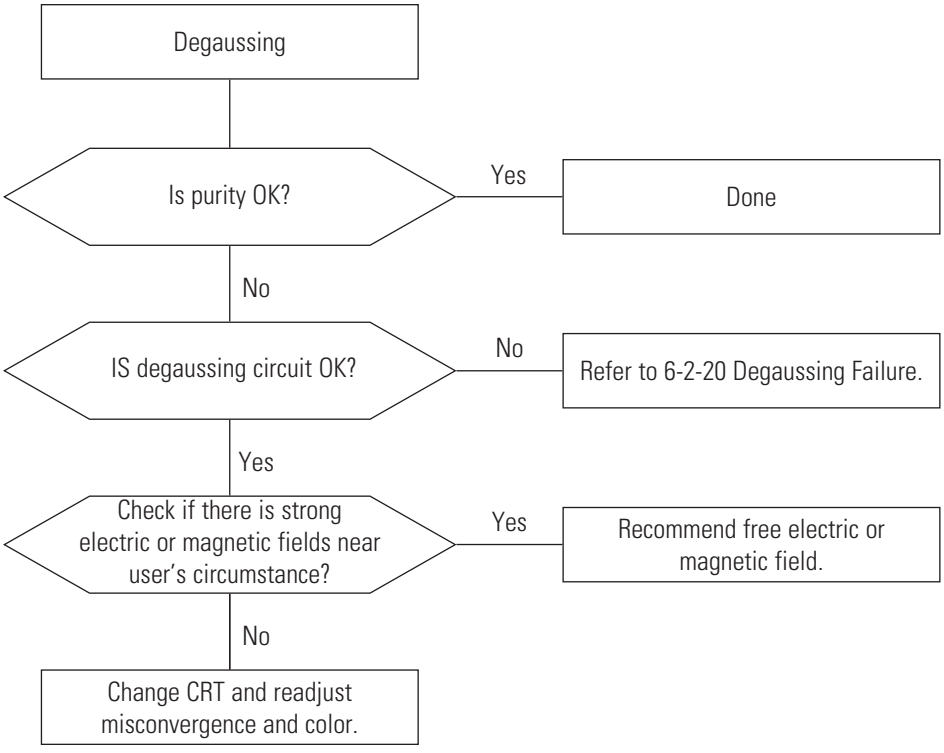

## 6-1-6 Misconvergence



### 6-1-7 Poor Focus




### 6-1-8 Purity Failure

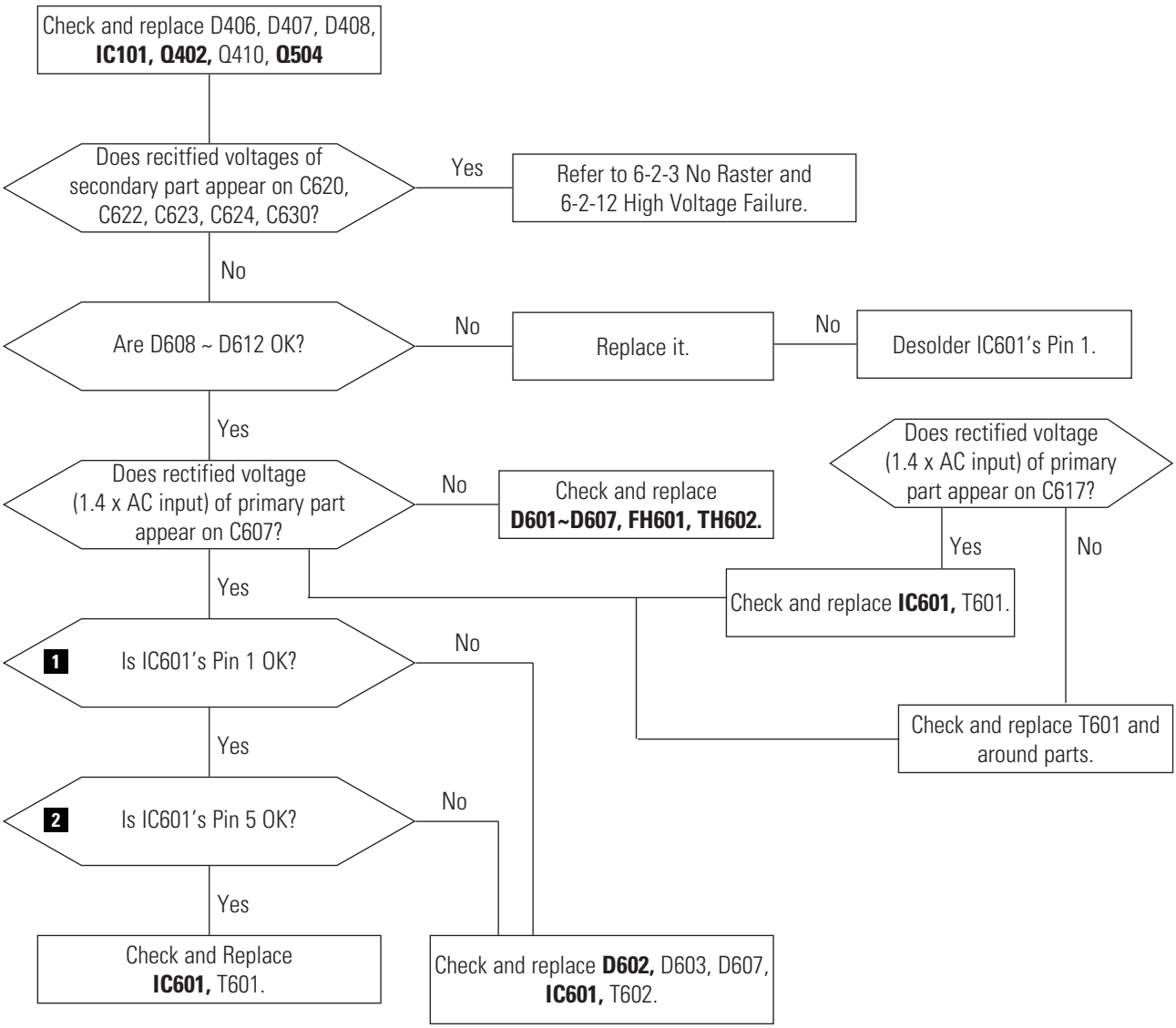


## 6-2 Detail Repair Section

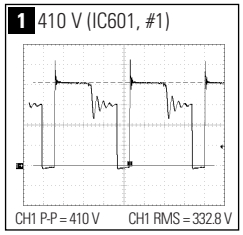
**Notes:** 1. If a picture does not appear

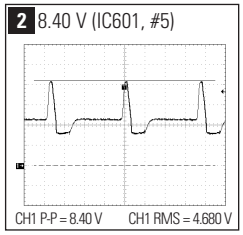
check first
- if AC power cord is plugged or not,
- if signal cable is connected or not,
- if signal generator (PC) is operated well or not (DPMS mode)
- if the Timing mode is out of spec or not (14": 30~55 kHz, 15": 30~61 kHz)

### 6-2-1 No Power


Check and replace D406, D407, D408, **IC101, Q402,** Q410, **Q504**
Does recitfied voltages of secondary part appear on C620, C622, C623, C624, C630?
Yes
Refer to 6-2-3 No Raster and 6-2-12 High Voltage Failure.
No
Are D608 ~ D612 OK?
No
Replace it.
No
Desolder IC601's Pin 1.
Yes
Does rectified voltage (1.4 x AC input) of primary part appear on C607?
No
Check and replace **D601~D607, FH601, TH602.**
Does rectified voltage (1.4 x AC input) of primary part appear on C617?
Yes
No
Yes
Check and replace **IC601,** T601.
1 Is IC601's Pin 1 OK?
No
Check and replace T601 and around parts.
Yes
2 Is IC601's Pin 5 OK?
No
Yes
Check and Replace **IC601,** T601.
Check and replace **D602,** D603, D607, **IC601,** T602.

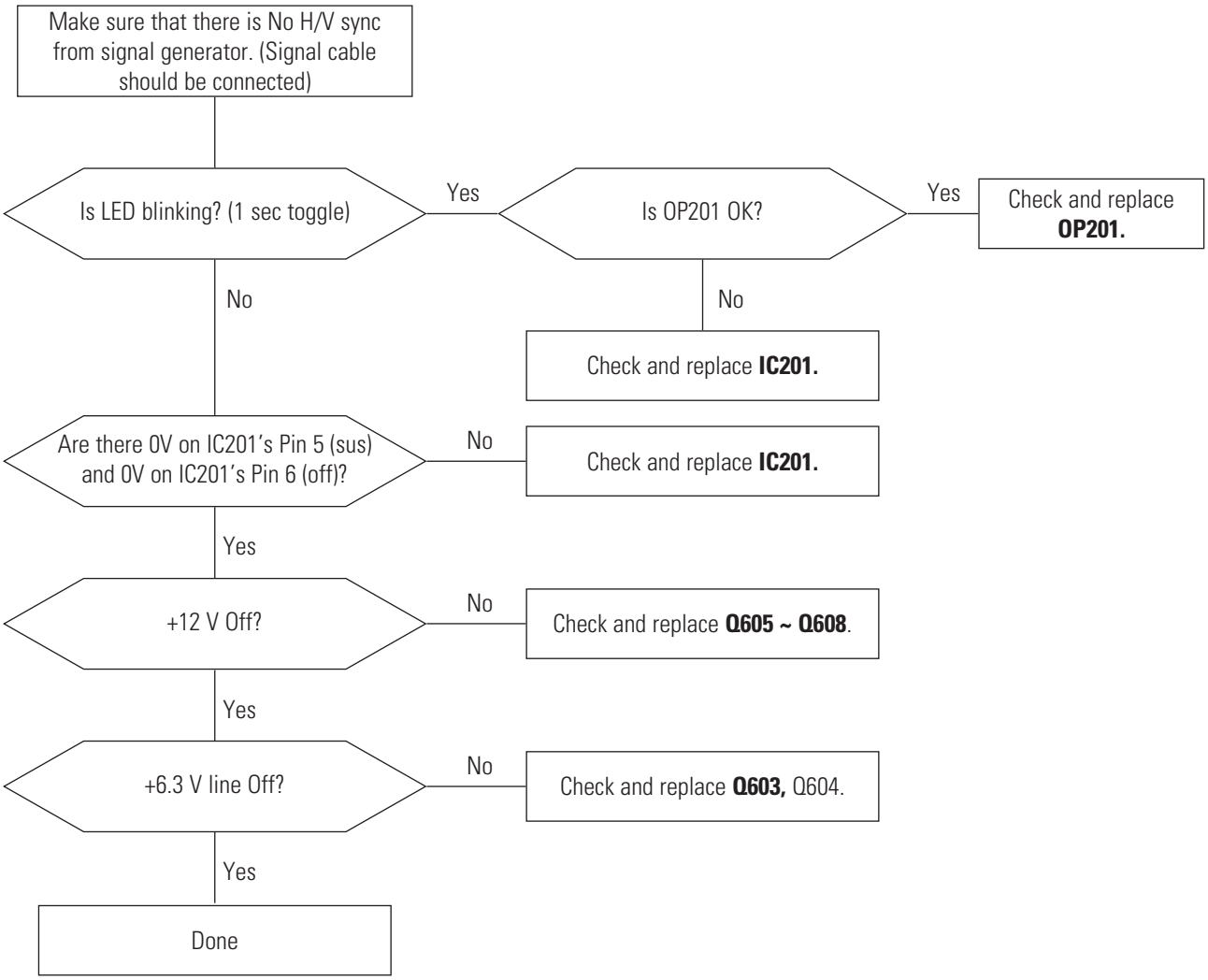
**WAVEFORMS**



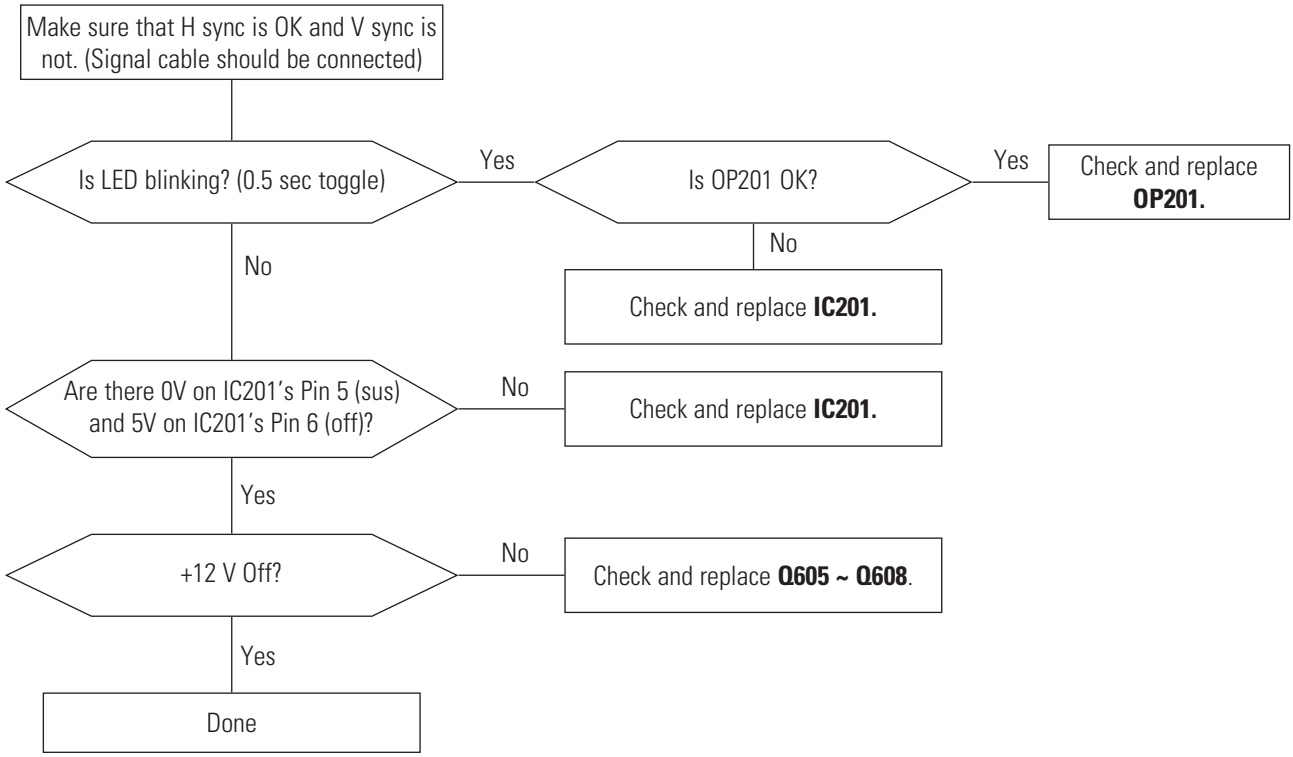



## 6-2-2 DPMS Failure

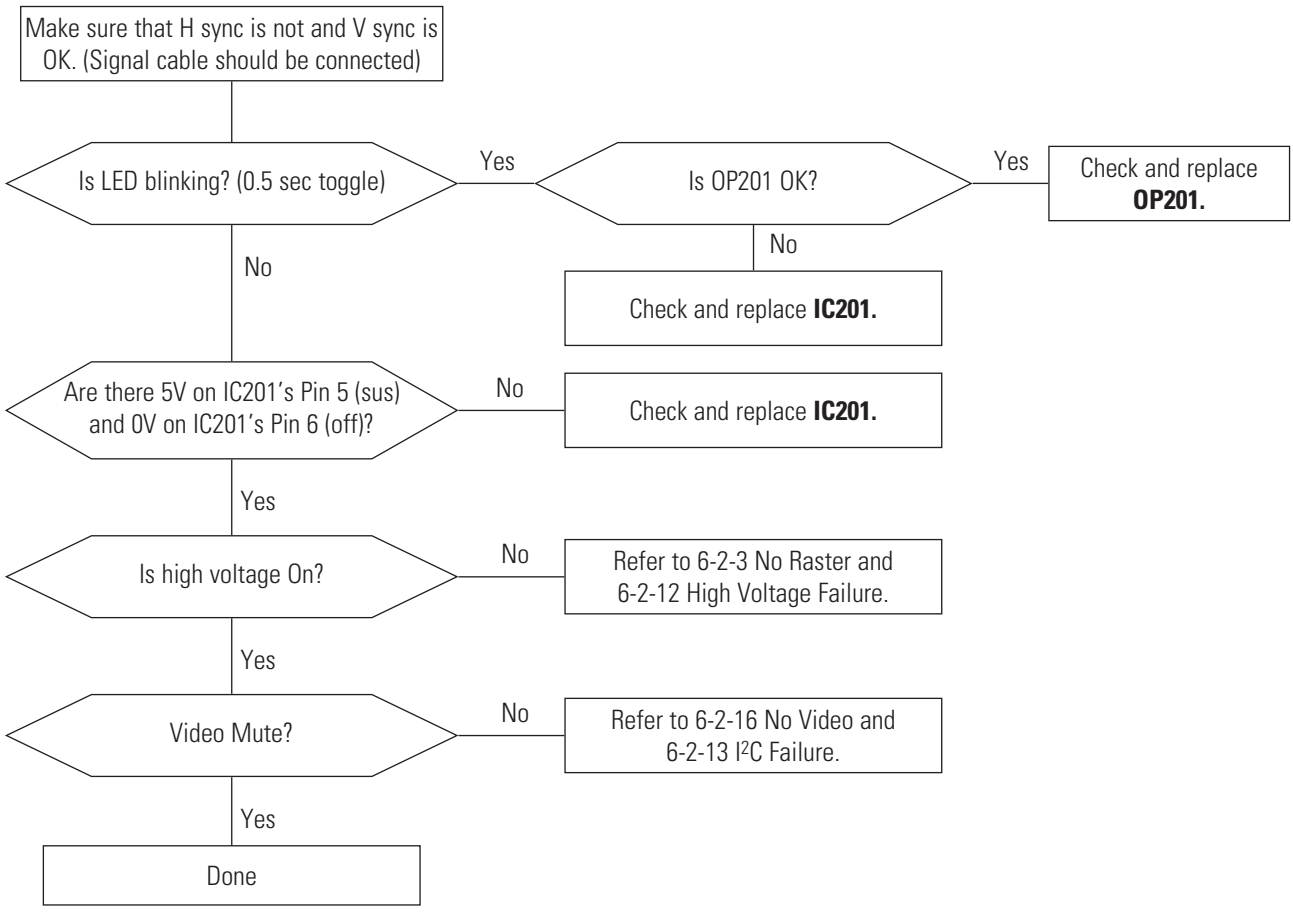
### 6-2-2 (a) Off Mode (No H/V sync)



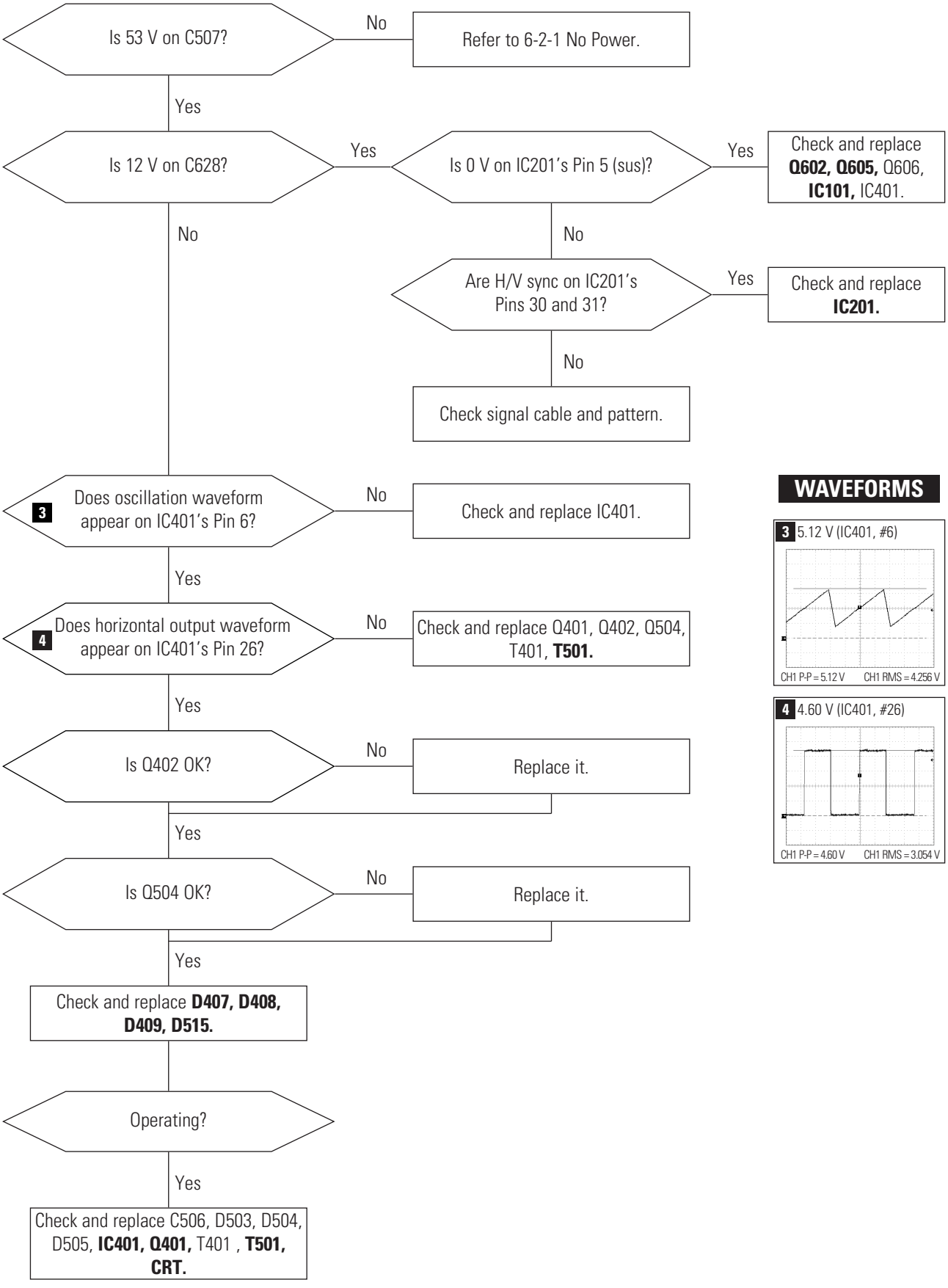
**6-2-2 (b) Suspend Mode (H sync: OK, V sync: No)**




**6-2-2 (c) Stand-by Mode (H sync: No, V sync: OK)**


Make sure that H sync is not and V sync is OK. (Signal cable should be connected)
Is LED blinking? (0.5 sec toggle)
Yes
Is OP201 OK?
Yes
Check and replace OP201.
No
Check and replace IC201.
No
Are there 5V on IC201's Pin 5 (sus) and 0V on IC201's Pin 6 (off)?
No
Check and replace IC201.
Yes
Is high voltage On?
No
Refer to 6-2-3 No Raster and 6-2-12 High Voltage Failure.
Yes
Video Mute?
No
Refer to 6-2-16 No Video and 6-2-13 I2C Failure.
Yes
Done

**6-2-3 No Raster** : No Raster means (Power: OK, High Voltage: No)




**WAVEFORMS**

## 6-2-4 S-correction Failure

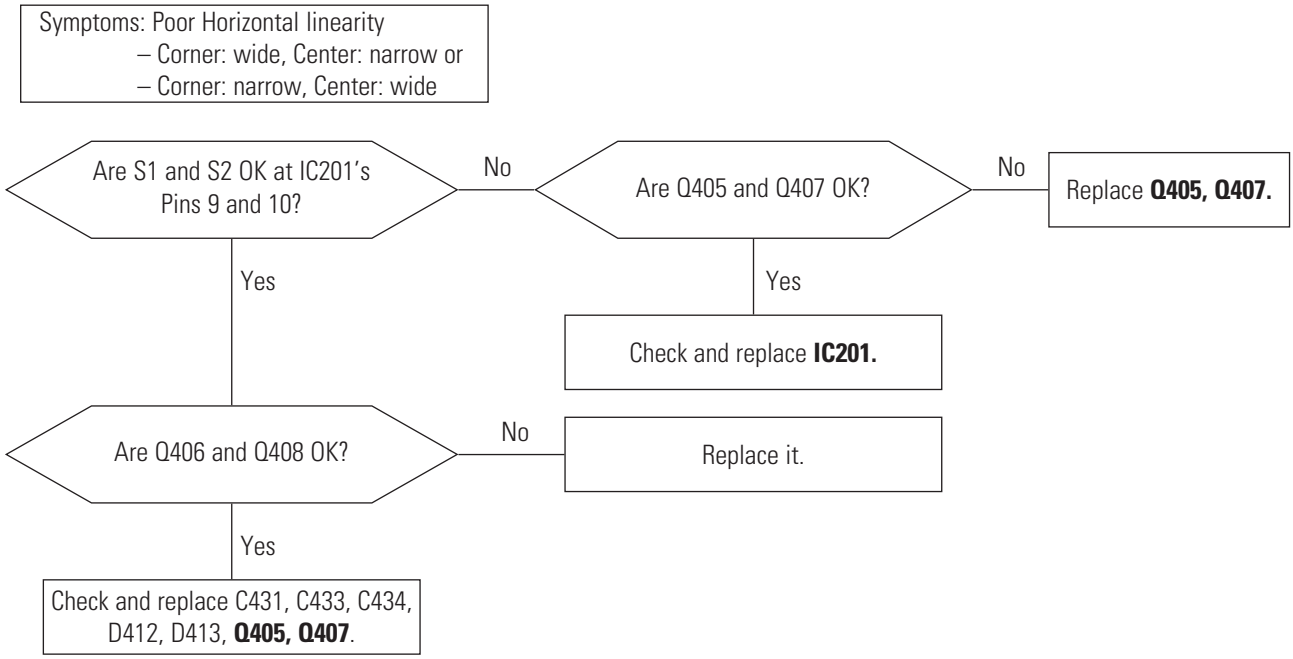
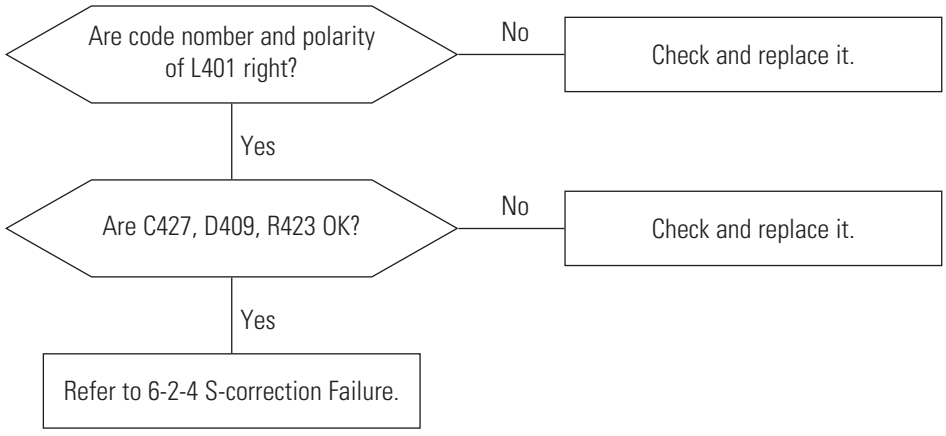



Table 6-1.

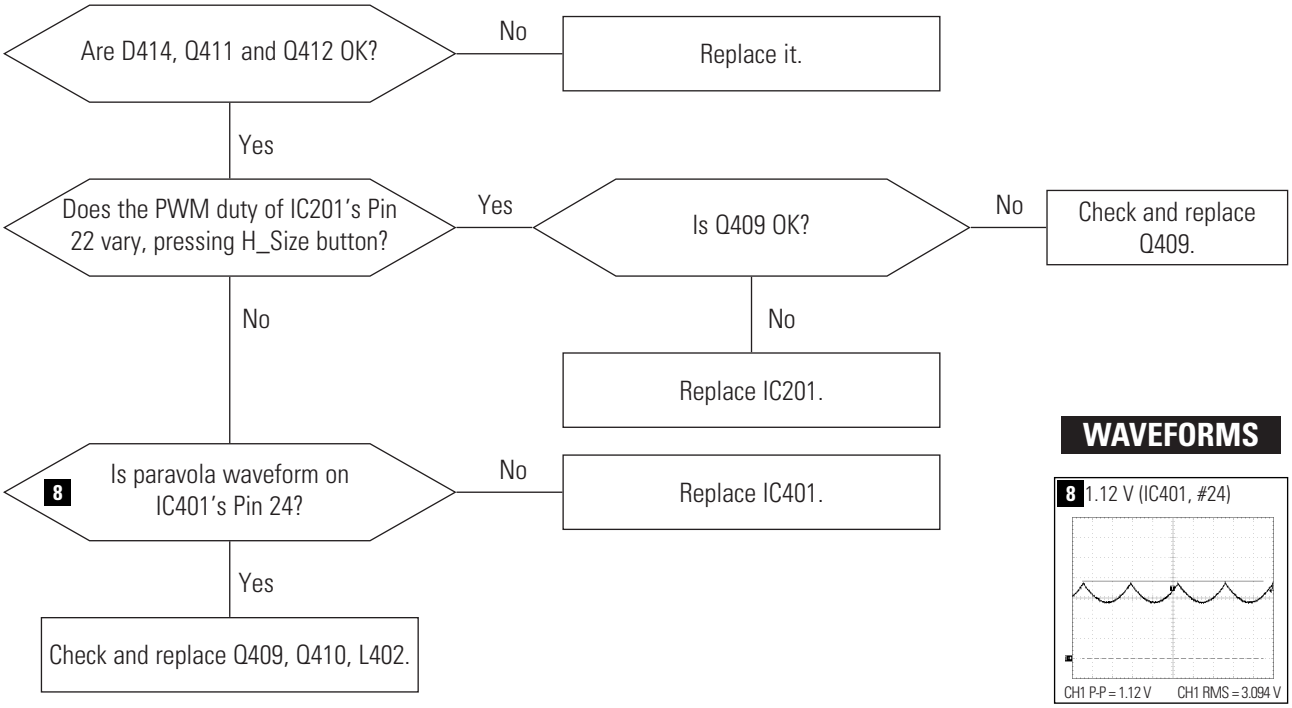
| | 31 ~ 35 | 35 ~ 40 | 40 ~ 49 | 49 ~ 61 |
|---|---|---|---|---|
| S1 | 0 V | 0 V | 5 V | 5 V |
| S2 | 0 V | 5 V | 0 V | 5 V |

* As CRT vendor and inch, there are differential items like C431, C433, C434, L401, R231, R441.
If you want to change a PCB board to another one that is for different CRT and inch, you have to change differential items at schematic diagram.

## 6-2-5 H-Linearity Failure



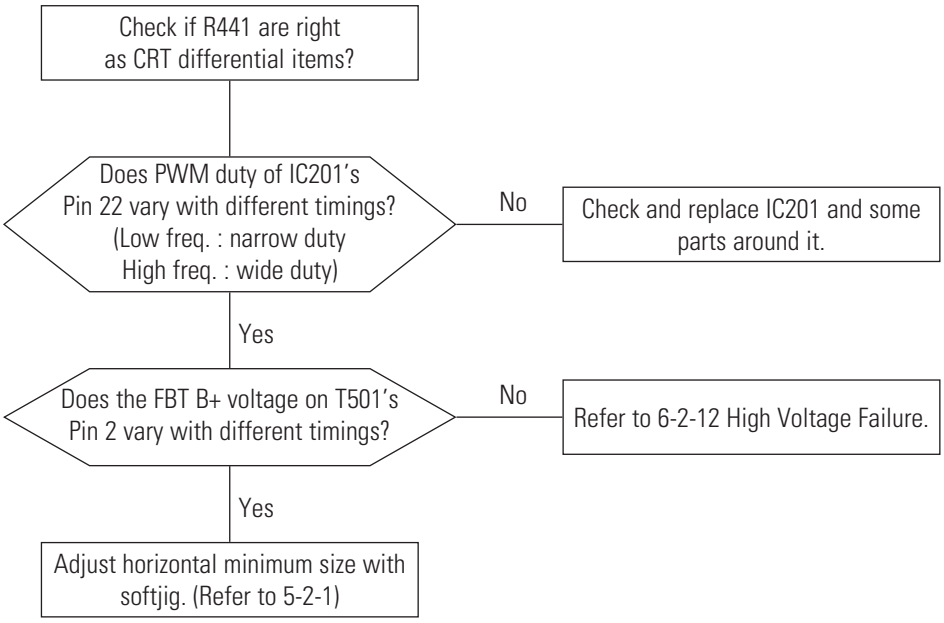
## 6-2-6 Invariable H_Size



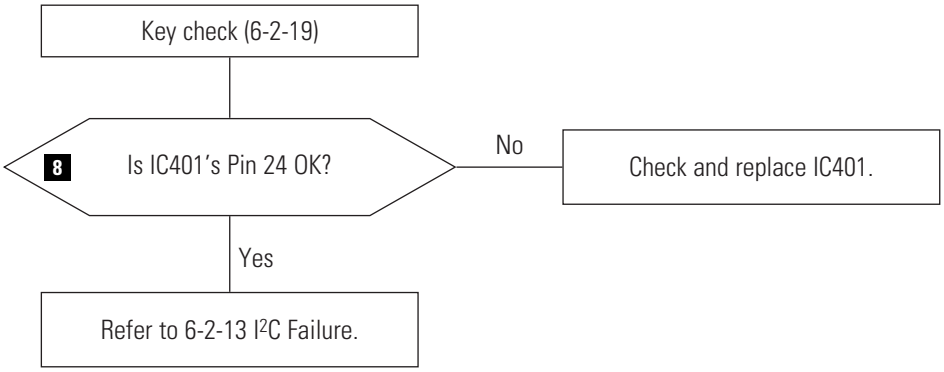

**WAVEFORMS**



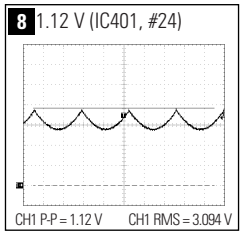

## 6-2-7 Abnormal H_Size


Check if R441 are right as CRT differential items?
Does PWM duty of IC201's Pin 22 vary with different timings? (Low freq. : narrow duty High freq. : wide duty)
No
Check and replace IC201 and some parts around it.
Yes
Does the FBT B+ voltage on T501's Pin 2 vary with different timings?
No
Refer to 6-2-12 High Voltage Failure.
Yes
Adjust horizontal minimum size with softjig. (Refer to 5-2-1)

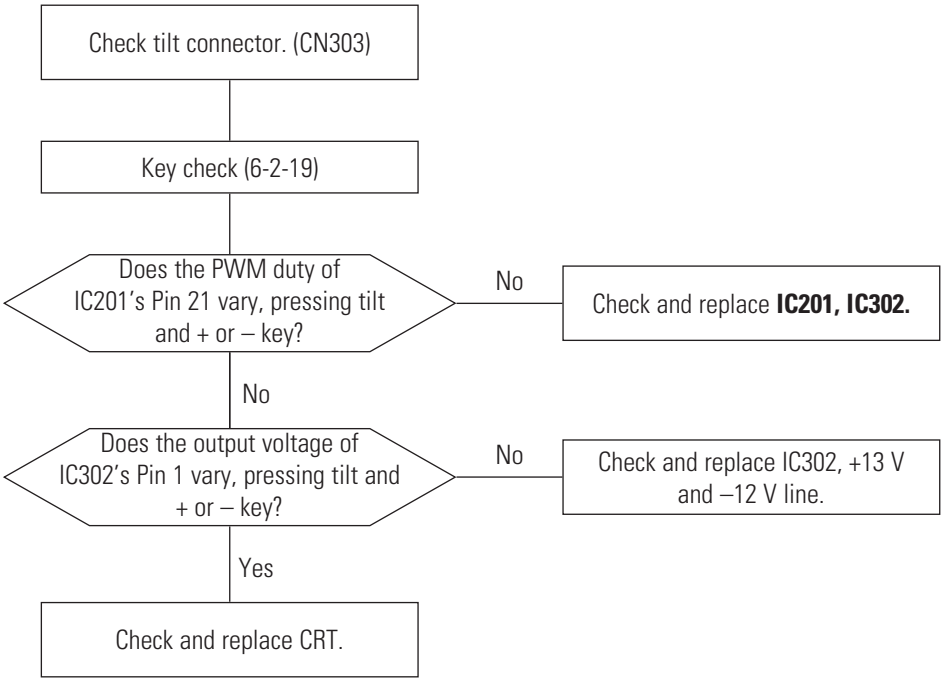
## 6-2-8 S_Pin, Trap, Para, V_Lin, Pin_Bal Failure



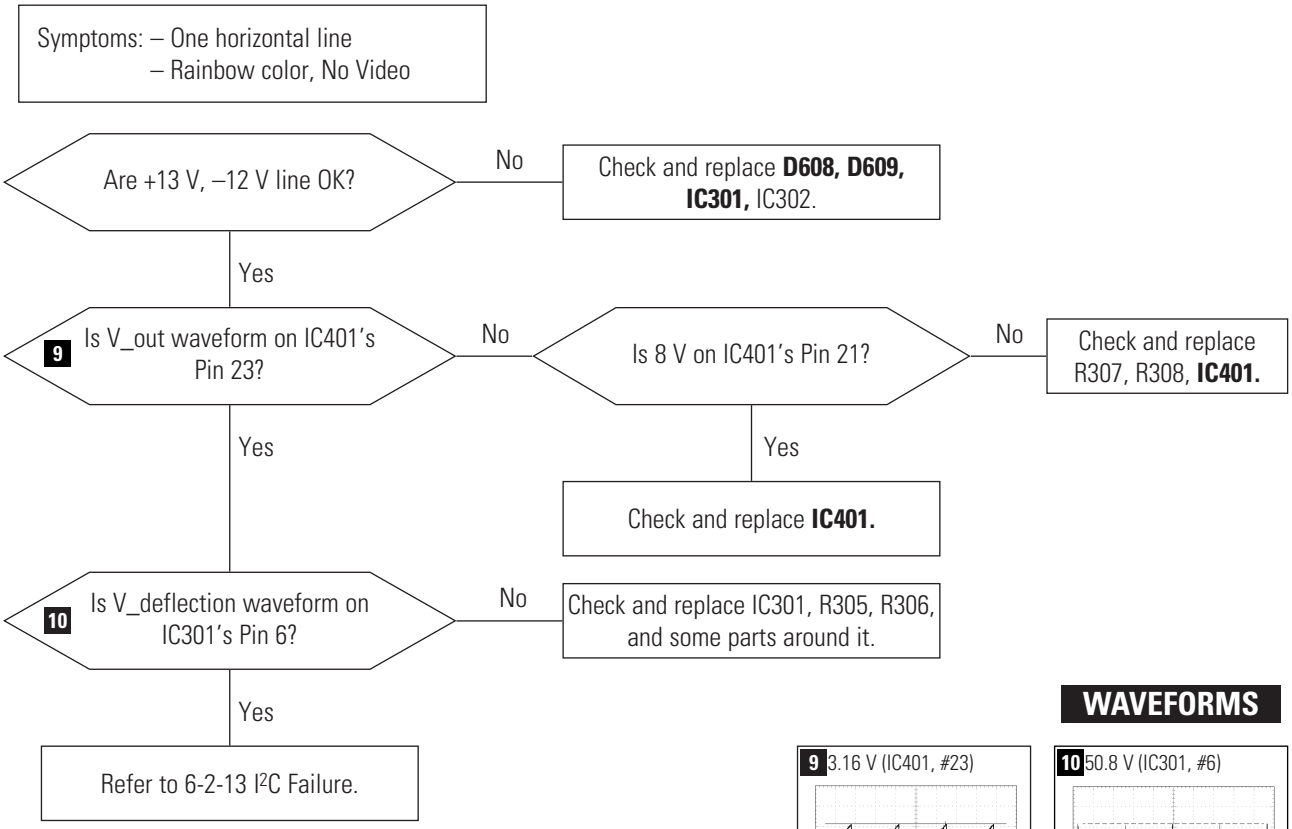

**WAVEFORMS**



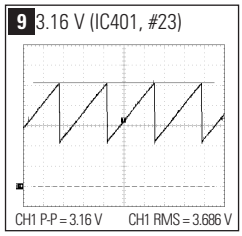

## 6-2-9 Tilt Failure

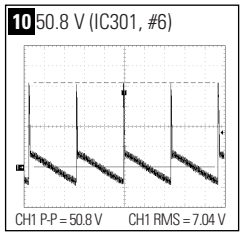

Check tilt connector. (CN303)
Key check (6-2-19)
Does the PWM duty of IC201's Pin 21 vary, pressing tilt and + or – key?
No
Check and replace IC201, IC302.
No
Does the output voltage of IC302's Pin 1 vary, pressing tilt and + or – key?
No
Check and replace IC302, +13 V and –12 V line.
Yes
Check and replace CRT.

## 6-2-10 Vertical Deflection Failure

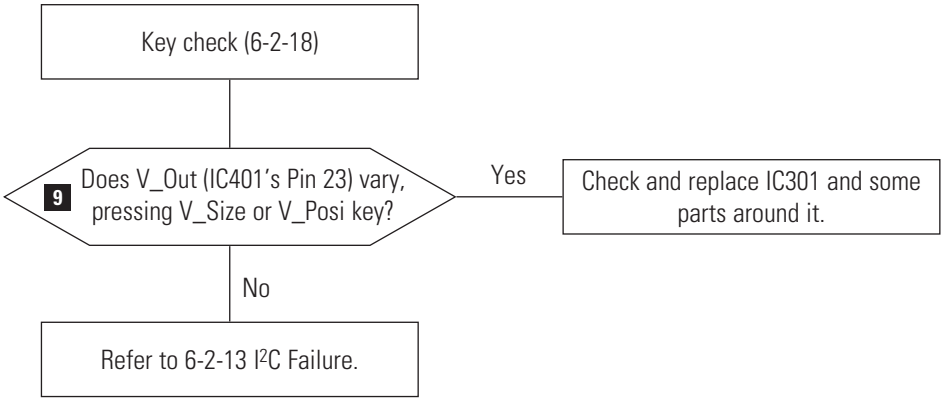

Symptoms: – One horizontal line
– Rainbow color, No Video
Are +13 V, –12 V line OK?
No
Check and replace **D608, D609, IC301,** IC302.
Yes
9 Is V_out waveform on IC401's Pin 23?
No
Is 8 V on IC401's Pin 21?
No
Check and replace R307, R308, **IC401.**
Yes
Yes
Check and replace **IC401.**
10 Is V_deflection waveform on IC301's Pin 6?
No
Check and replace IC301, R305, R306, and some parts around it.
Yes
Refer to 6-2-13 I²C Failure.

**WAVEFORMS**

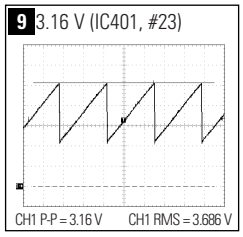



## 6-2-11 Invariable V_Size or V_Position


Key check (6-2-18)
9 Does V_Out (IC401's Pin 23) vary, pressing V_Size or V_Posi key?
Yes
Check and replace IC301 and some parts around it.
No
Refer to 6-2-13 I²C Failure.

**WAVEFORMS**



## 6-2-12 High Voltage Failure

Symptoms 1: – No Power
– No Raster
– Unstable operation (Fixed FBT B+ voltage with different H_frequency, Over 31 kHz: whistle sound, Narrow H_Size, Unsynchronized image, 31 kHz: OK)

Is 53 V on C623?
No → Refer to 6-2-1 No Power.
Yes

**13** Is Q504's drain waveform ok?
No → Are D515, L501, Q504 ok?
No → Check and replace it.
Yes → Are D403, D408, D409, Q402 and Q411, Q412 ok?
No → Check and replace it.
Yes → Check and replace AFC input line from T501 to IC401's Pin 12. : **C408, R406.**

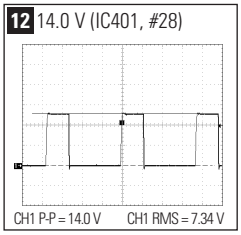
Yes

Are D502, D503, R509, R510 ok?
No → Check and replace it.
Yes

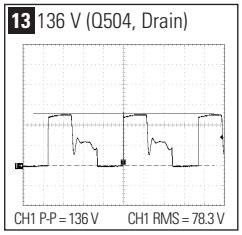
**12** Does B_Out duty of IC401's Pin 28 vary with different H_frequency and image load (Full White or No Video)?
No → Check and replace Q502, Q503, **IC401, T501** and REG_IN line to IC401's Pin 15.
Yes → Check and replace Q502, Q503, IC401, T501.

## WAVEFORMS

**12** 14.0 V (IC401, #28)




**13** 136 V (Q504, Drain)



Symptoms 2: – X-ray protection
– One vertical line and then high voltage shut down.

Are C417, C504, D502, D503, R509 and R510 ok?

No → Check and replace it.

Yes

Check and replace **D407, D408, D414, Q402, Q504, IC401.**

Check and replace **IC201.**

## 6-2-13 I²C Failure

– Almost data (Horizontal drive duty, FBT B+ duty, display image data, color data) is transferred from IC201 to IC203 and IC401 through I²C data line during power on.
– After user adjusts display image data, contrast and brightness data, these are saved to IC203.

Key check (6-2-18)

Is 5 V on IC401's Pin 32 and IC203's Pin 8?

No → Check and replace it.

Yes

14 Is there data communication on IC401's Pins 30 and 31?

No

Yes

14 Is there data communication on IC401's Pins 30 and 31 during I²C function? (H/V Posi, V_Size, S_Pin, Trap, Cont, Bright)

No → Check I²C data and clock line.

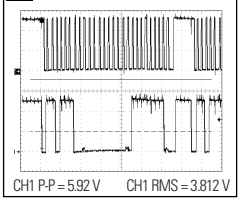
Check and replace I²C devices. **(IC201, IC203, IC401)**

Yes

Done

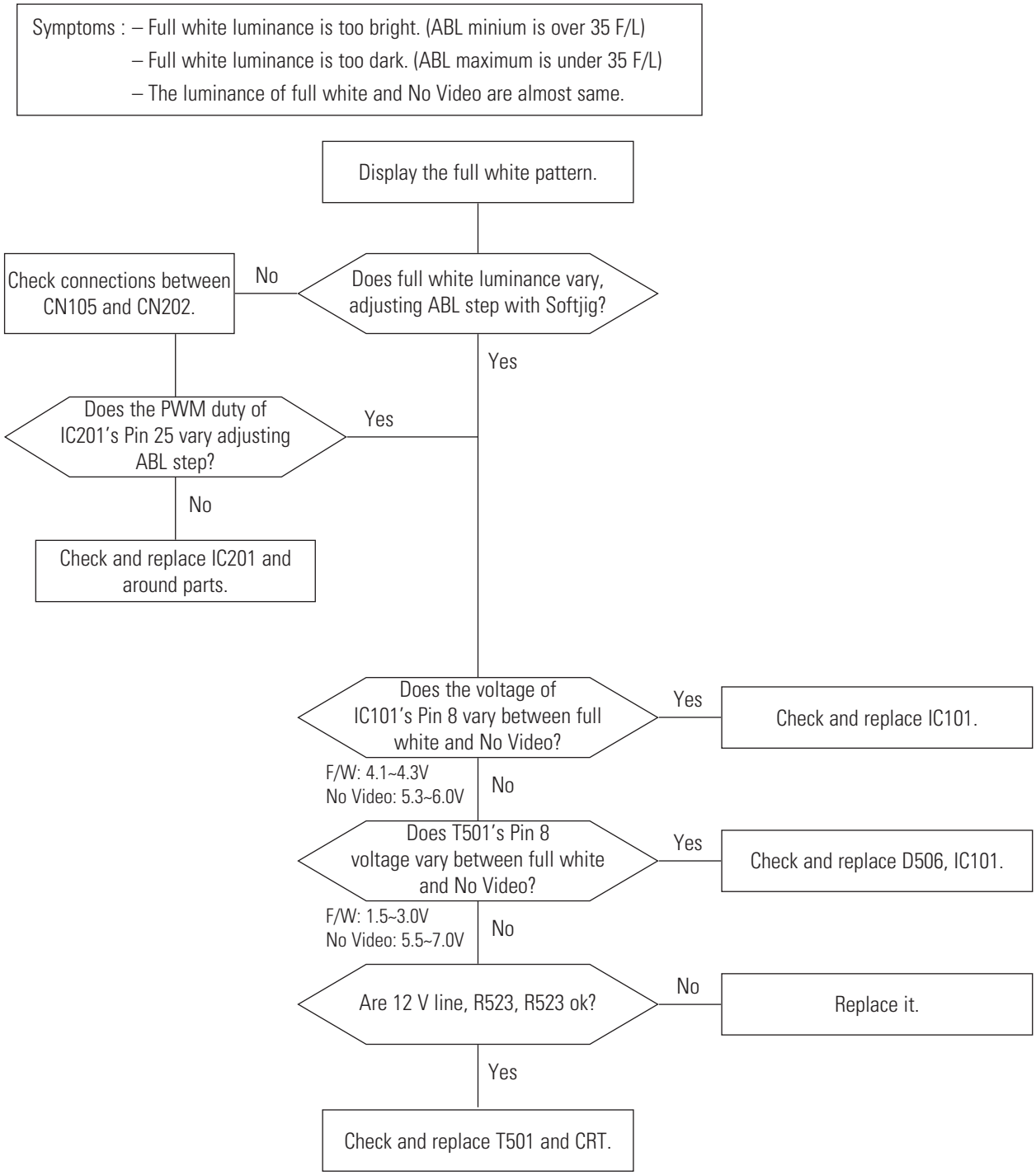
**WAVEFORMS**

14 5.92 V (IC203, #5, 6)

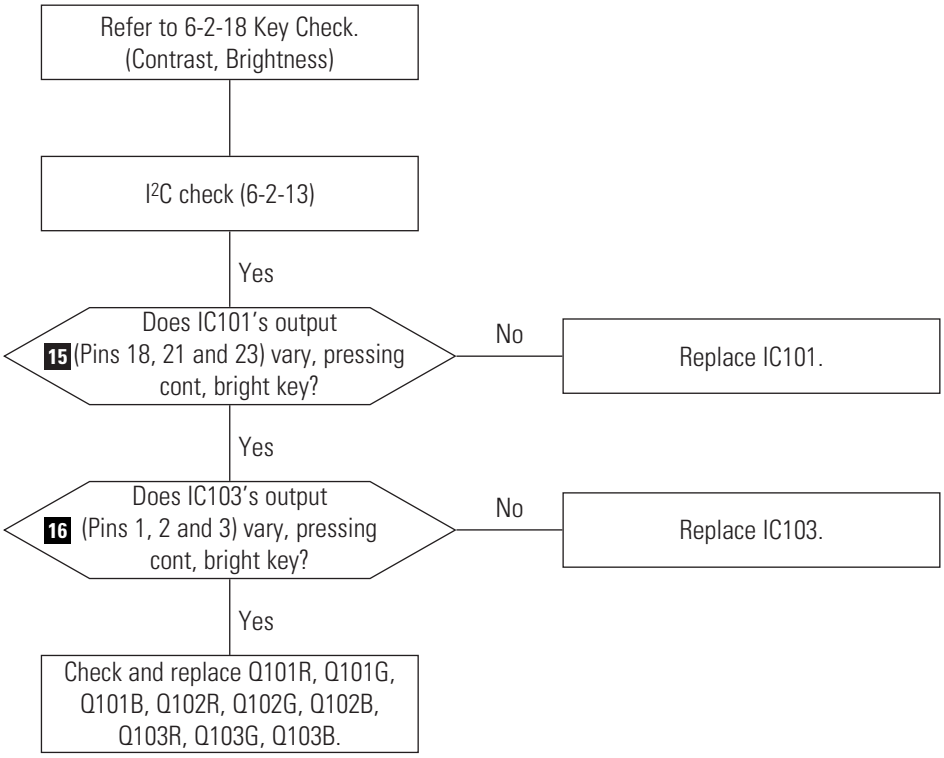



CH1 : IC401's Pin 31
CH2 : IC401's Pin 30

## 6-2-14 ABL Failure

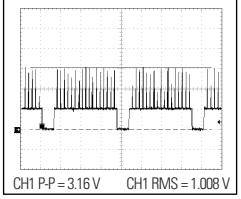

Symptoms : – Full white luminance is too bright. (ABL minium is over 35 F/L)
– Full white luminance is too dark. (ABL maximum is under 35 F/L)
– The luminance of full white and No Video are almost same.
Display the full white pattern.
Does full white luminance vary, adjusting ABL step with Softjig?
No
Check connections between CN105 and CN202.
Yes
Does the PWM duty of IC201's Pin 25 vary adjusting ABL step?
Yes
No
Check and replace IC201 and around parts.
Does the voltage of IC101's Pin 8 vary between full white and No Video?
Yes
Check and replace IC101.
F/W: 4.1~4.3V
No Video: 5.3~6.0V
No
Does T501's Pin 8 voltage vary between full white and No Video?
Yes
Check and replace D506, IC101.
F/W: 1.5~3.0V
No Video: 5.5~7.0V
No
Are 12 V line, R523, R523 ok?
No
Replace it.
Yes
Check and replace T501 and CRT.

## 6-2-15 Invariable Contrast, Brightness Control

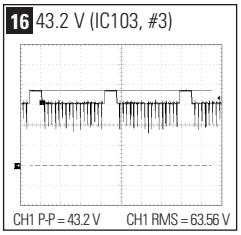



**WAVEFORMS**

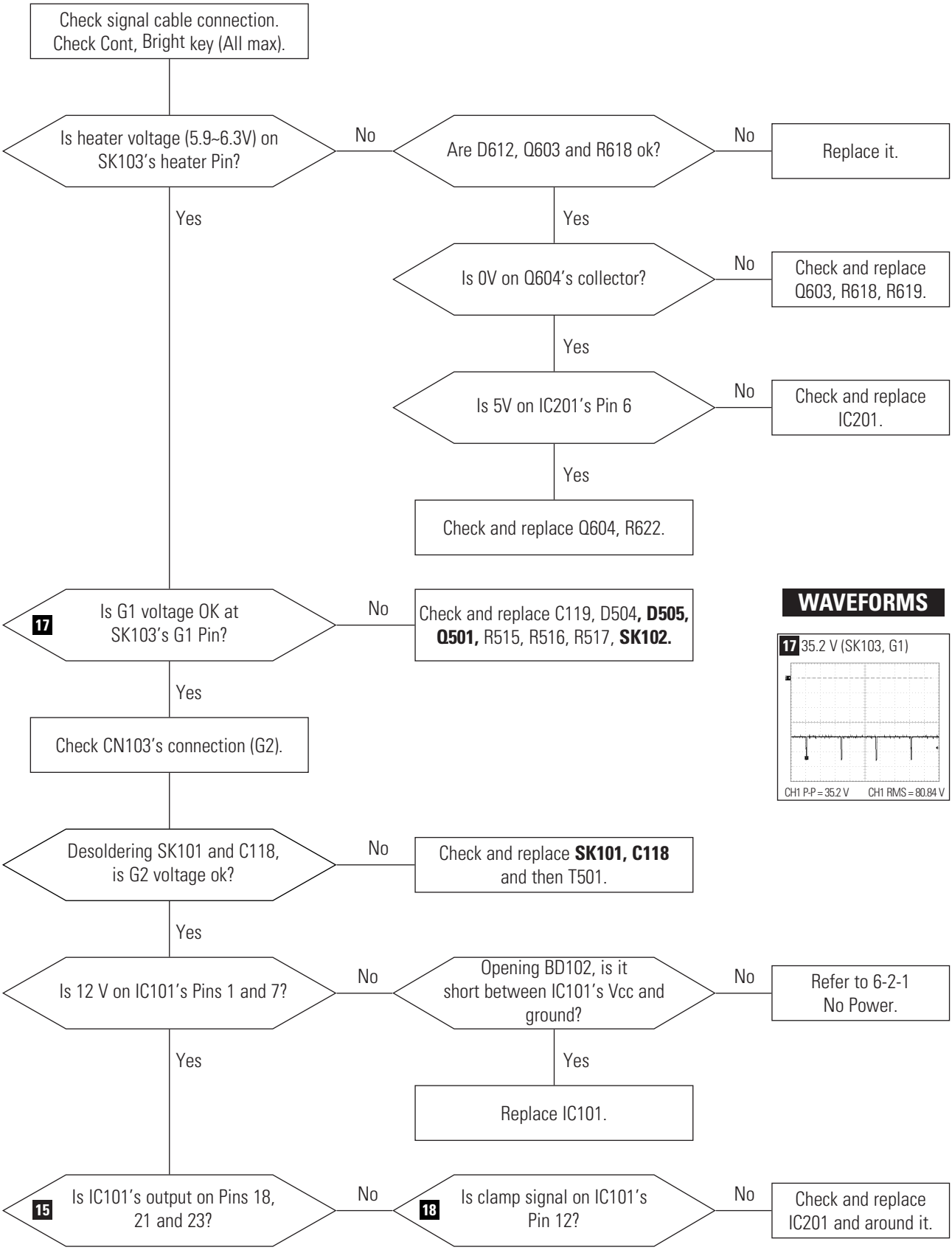
**15** 3.16 V (IC101, #21)



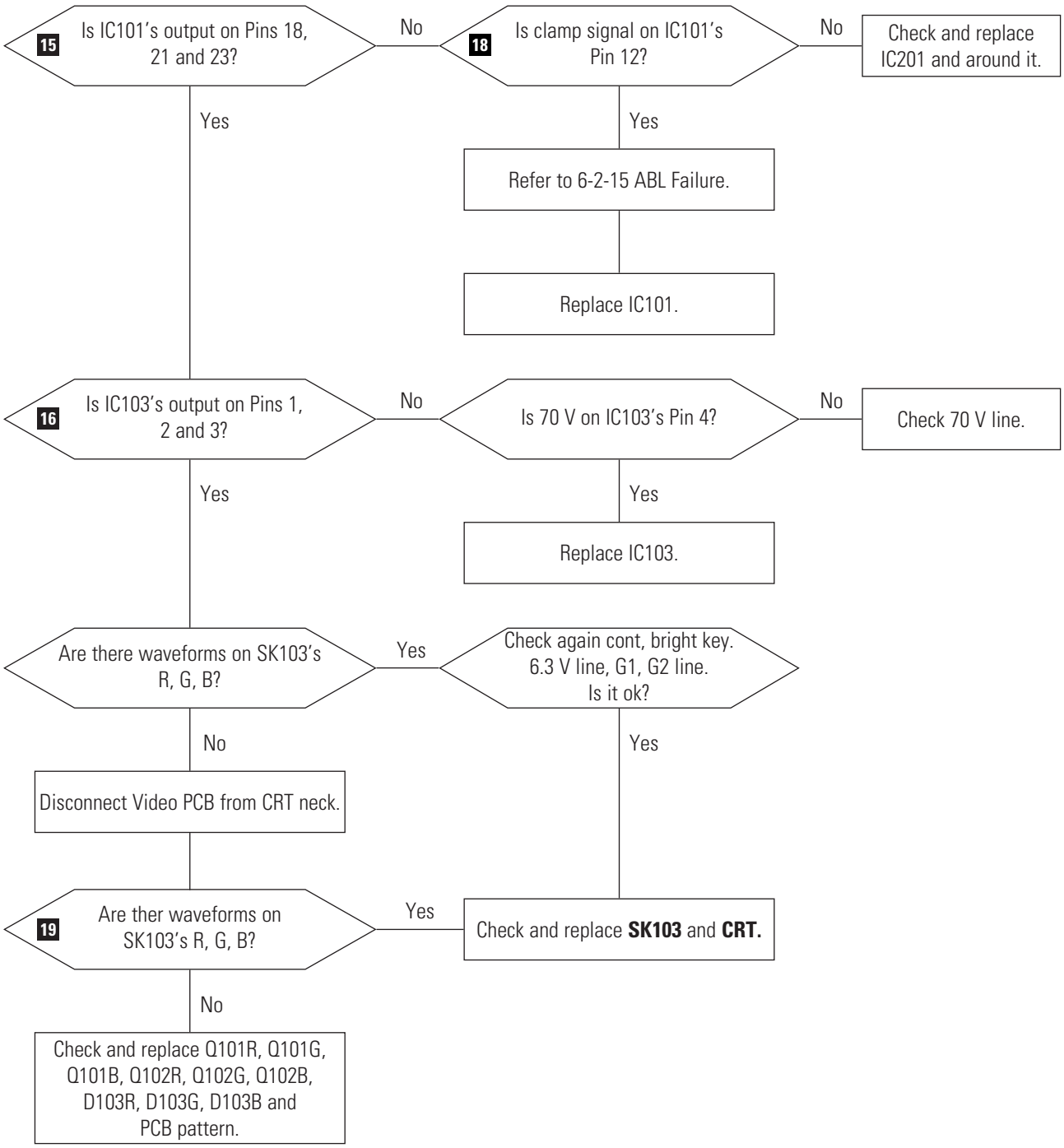

**16** 43.2 V (IC103, #3)



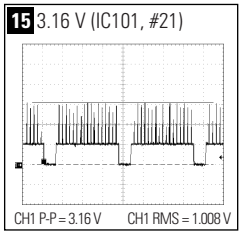
## 6-2-16 No Video

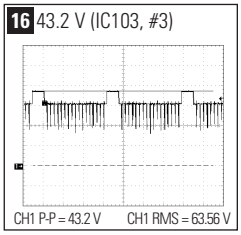


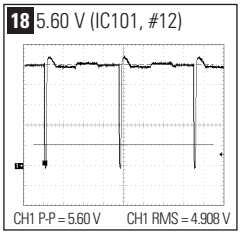
## 6-2-16 No Video Continued

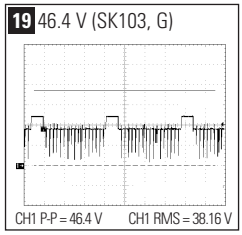

15 Is IC101's output on Pins 18, 21 and 23?
No
18 Is clamp signal on IC101's Pin 12?
No
Check and replace IC201 and around it.
Yes
Yes
Refer to 6-2-15 ABL Failure.
Replace IC101.
16 Is IC103's output on Pins 1, 2 and 3?
No
Is 70 V on IC103's Pin 4?
No
Check 70 V line.
Yes
Yes
Replace IC103.
Are there waveforms on SK103's R, G, B?
Yes
Check again cont, bright key. 6.3 V line, G1, G2 line. Is it ok?
No
Yes
Disconnect Video PCB from CRT neck.
19 Are ther waveforms on SK103's R, G, B?
Yes
Check and replace SK103 and CRT.
No
Check and replace Q101R, Q101G, Q101B, Q102R, Q102G, Q102B, D103R, D103G, D103B and PCB pattern.

## WAVEFORMS



## 6-2-17 Micom Failure

Check the connection of signal cable.

If signal cable is disconnected, self raster (No Video, Bright Raster) appears.

Check H/V sync from PC or signal generator.

If there is no H/V sync, monitor is operated as DPMS mode.

Check if timing is out of spec or not.

If out of sepc, monitor is operated as stand-by mode. (No Video, LED: 0.5 sec toggle)
14": Horizontal 30 ~ 55 kHz, Vertical 50 ~ 120 Hz
15": Horizontal 30 ~ 61 kHz, Vertical 50 ~ 120 Hz

Key check (all key) : Refer to 6-2-19.

Is 5V on IC201's Pins 11 and 34?

No

Is 13 V on C624?

No

Refer to 6-2-1
No Power.

Yes

Yes

Check and replace IC602.

20 Are oscillation (8 MHz) on IC202's Pins 13 and 14?

No

Check and replace C203, C204, X201.

Yes

Check reset part.
Are IC202 ok?

No

Replace it.

Yes

24 25 Are H/V sync input on IC201's Pins 30 and 31?

Yes

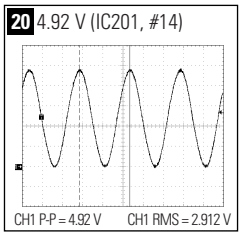
When disconnecting signal cable: Is 0V on IC201's Pin 19?
When connecting signal cable:
Is 5V on IC202's Pin 13?

No

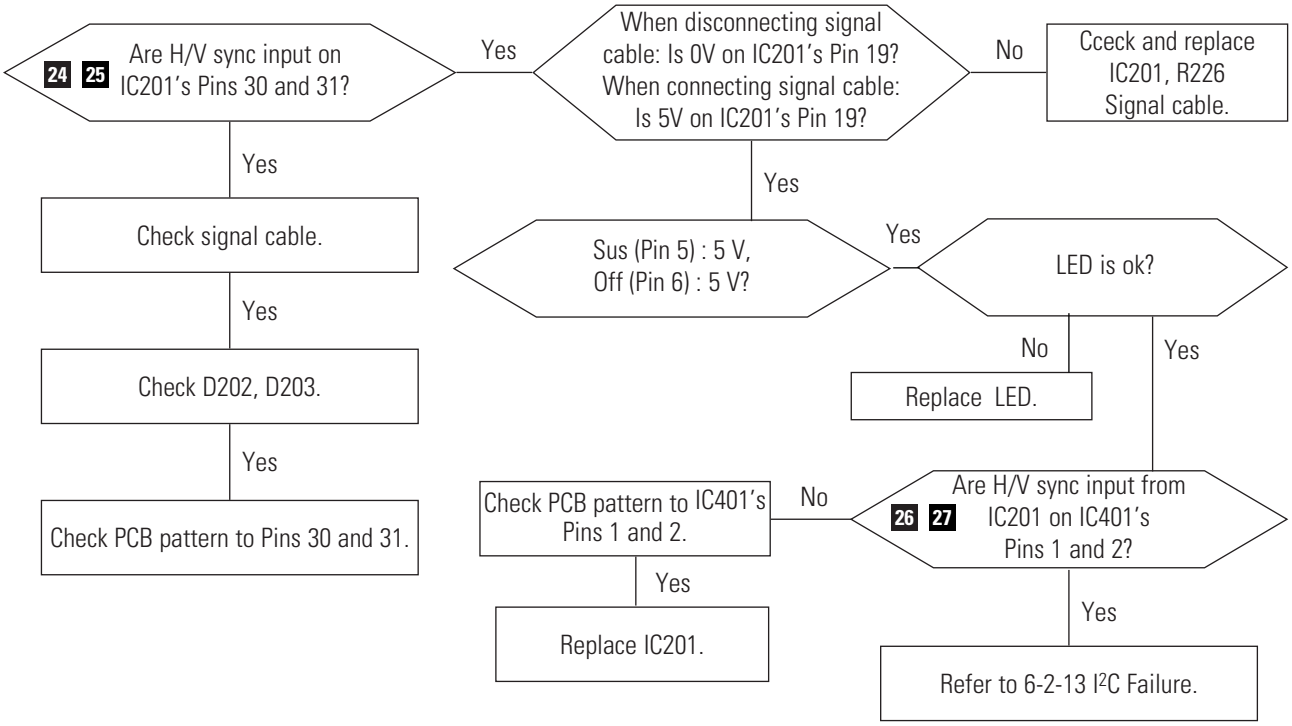
Cceck and replace
IC201, R226.

**WAVEFORMS**

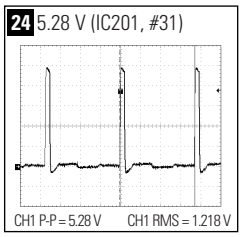
20 4.92 V (IC201, #14)

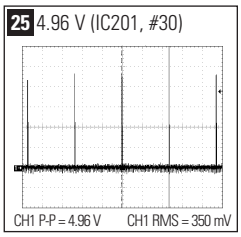


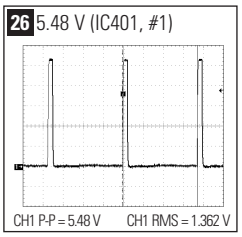
## 6-2-17 Micom Failure Continued

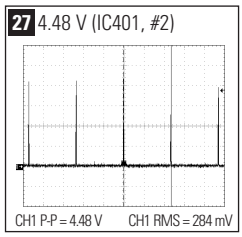

24 25 Are H/V sync input on IC201's Pins 30 and 31?
Yes
When disconnecting signal cable: Is 0V on IC201's Pin 19? When connecting signal cable: Is 5V on IC201's Pin 19?
No
Cceck and replace IC201, R226 Signal cable.
Yes
Check signal cable.
Yes
Check D202, D203.
Yes
Check PCB pattern to Pins 30 and 31.
Yes
Sus (Pin 5) : 5 V, Off (Pin 6) : 5 V?
Yes
LED is ok?
No
Replace LED.
Yes
Check PCB pattern to IC401's Pins 1 and 2.
No
26 27 Are H/V sync input from IC201 on IC401's Pins 1 and 2?
Yes
Replace IC201.
Yes
Refer to 6-2-13 I2C Failure.

## WAVEFORMS



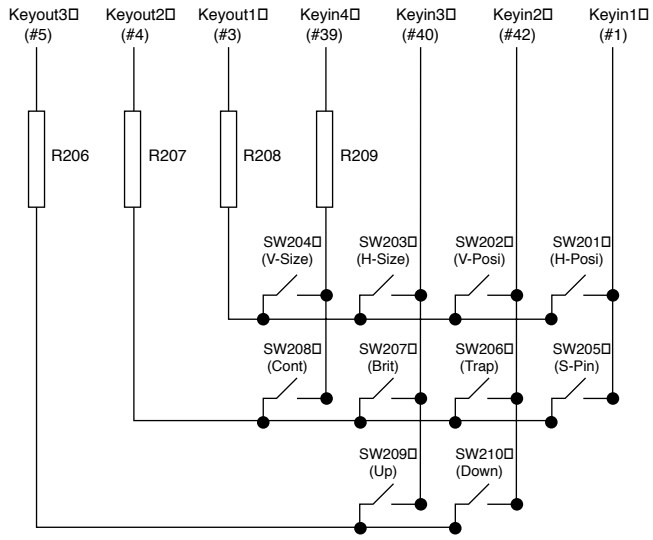



## 6-2-18 Key Check

1) Key Map



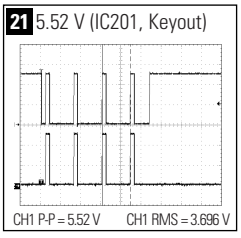

2) Voltage Check of Keyin and Keyout
   – Press the key what you want to check.
   – At that moment, the voltage of keyin and keyout that is connected with together should be changed as follows.

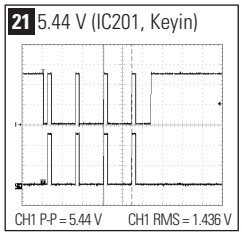
| | Normal | Pressed | RMS voltage |
|---|---|---|---|
| Keyout | 5 V | CH1 of Picture Pin 21 | 0.7 ~ 0.9 V |
| Keyin | 0 V | CH2 of Picture Pin 21 | 0.7 ~ 0.9 V |

3) LED Check
   – Pressing key, LED should be blinked.

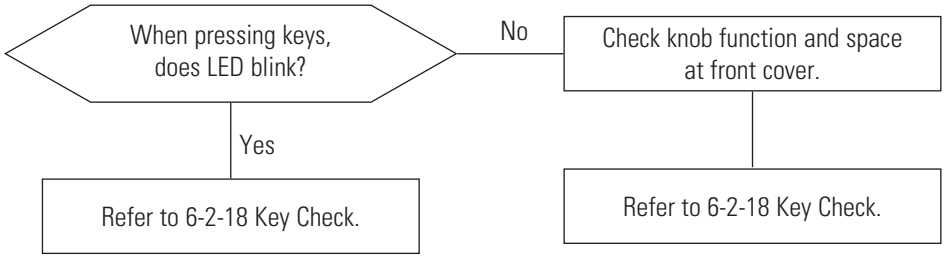
4) How to Repair?
   – If only one key has a key problem, replace that key.
   – But if some keys that are connected with same keyin or keyout line have problems, check and replace PCB pattern and IC201.

**WAVEFORMS**

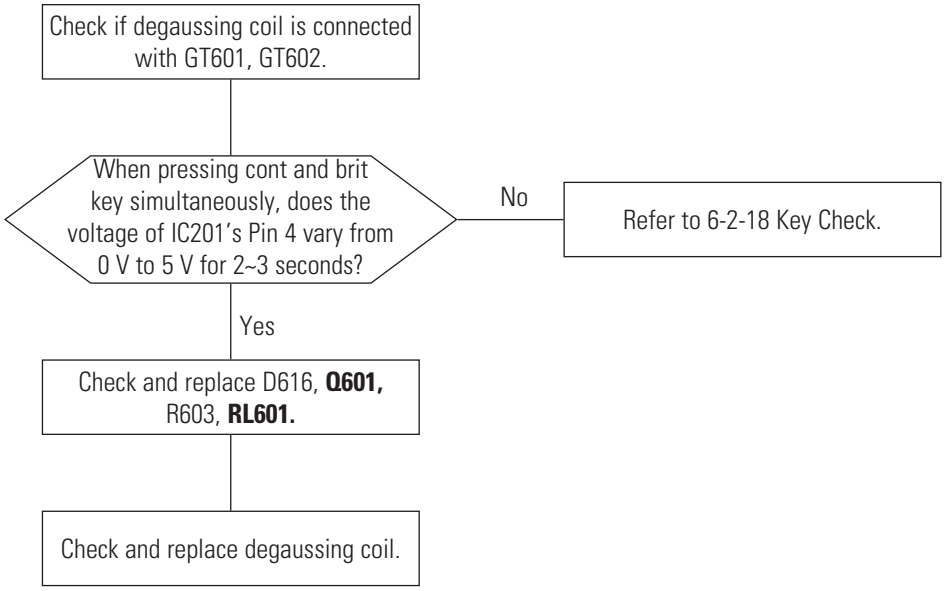


## 6-2-19 User Control Failure

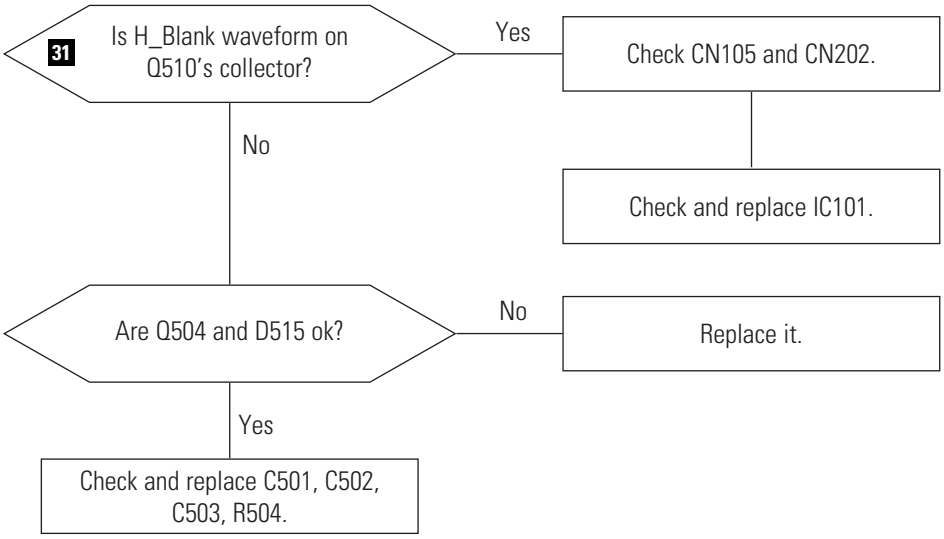

When pressing keys, does LED blink?
No
Check knob function and space at front cover.
Yes
Refer to 6-2-18 Key Check.
Refer to 6-2-18 Key Check.

## 6-2-20 Degaussing Failure

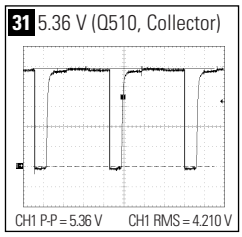

Check if degaussing coil is connected with GT601, GT602.
When pressing cont and brit key simultaneously, does the voltage of IC201's Pin 4 vary from 0 V to 5 V for 2~3 seconds?
No
Refer to 6-2-18 Key Check.
Yes
Check and replace D616, **Q601,** R603, **RL601.**
Check and replace degaussing coil.

## 6-2-21 Horizontal Blank Failure

Symptoms: – Dark image and if shifting image to left or right side, image is rolled.
– Raster left or right side is rolled.



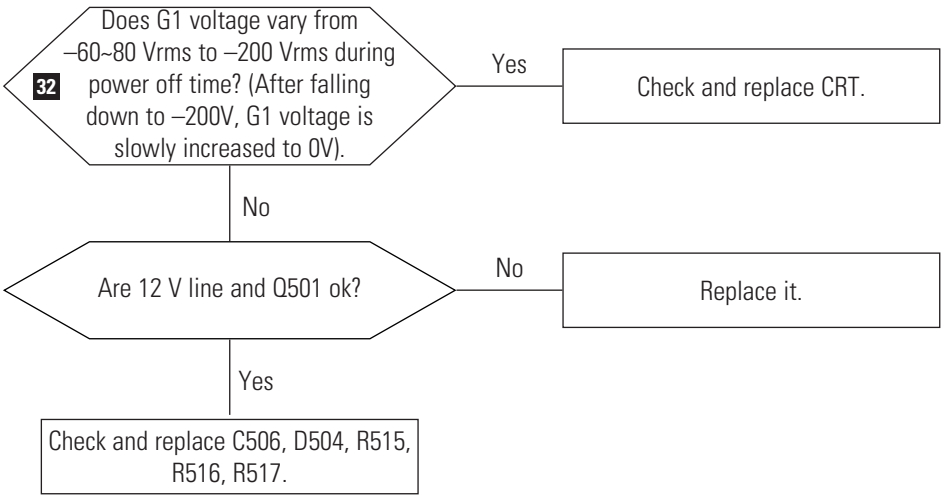

**WAVEFORMS**



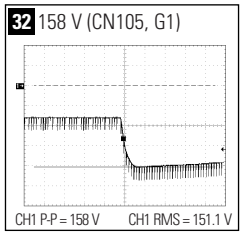

## 6-2-22 Whistle Sound

Check trans coil **(L401,** T501, T601, CRT)

## 6-2-23 Spot at Center During Power Off


Does G1 voltage vary from –60~80 Vrms to –200 Vrms during power off time? (After falling down to –200V, G1 voltage is slowly increased to 0V).
32
Yes
Check and replace CRT.
No
Are 12 V line and Q501 ok?
No
Replace it.
Yes
Check and replace C506, D504, R515, R516, R517.

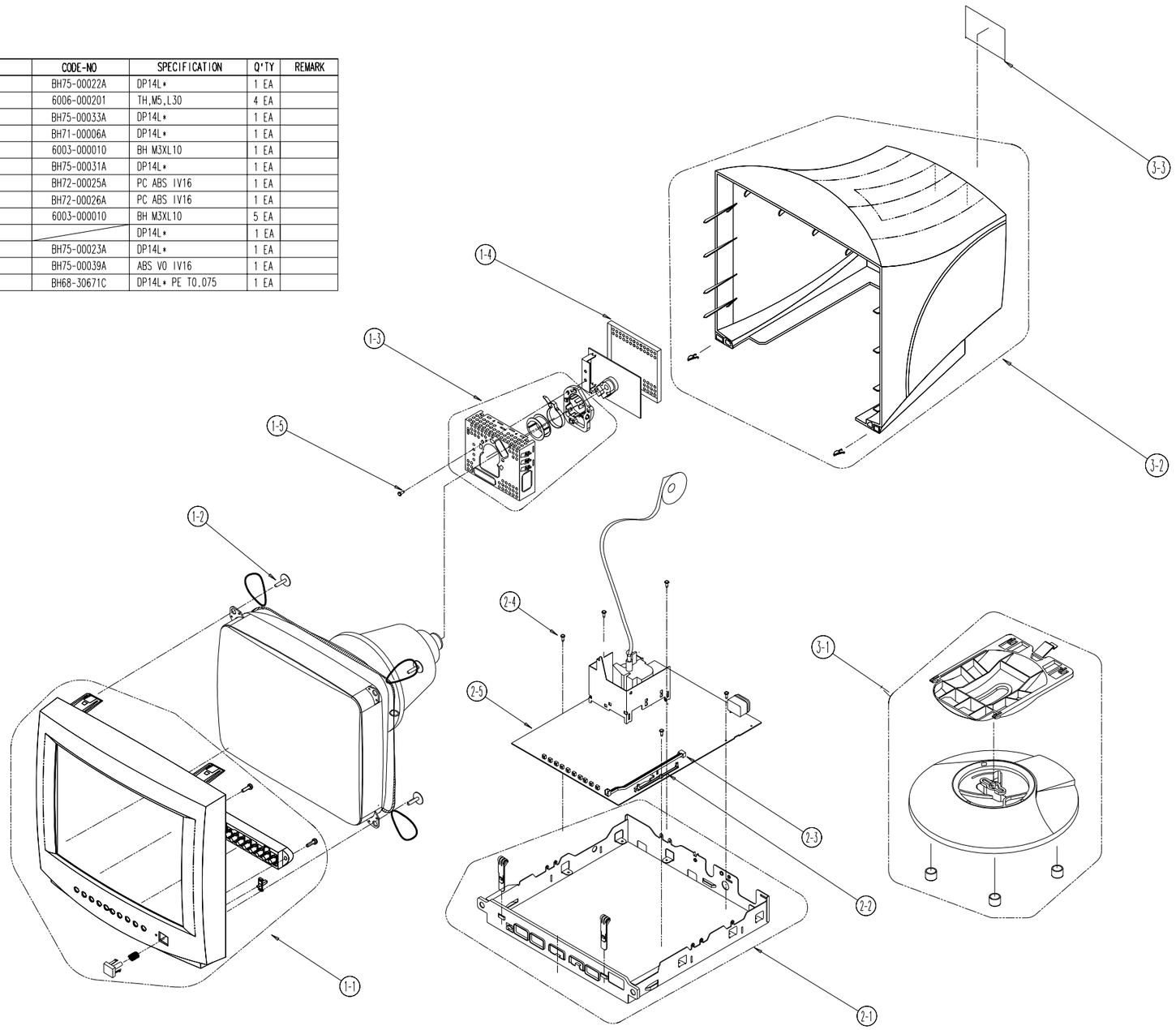
**WAVEFORMS**



# 7 Exploded View and Parts List

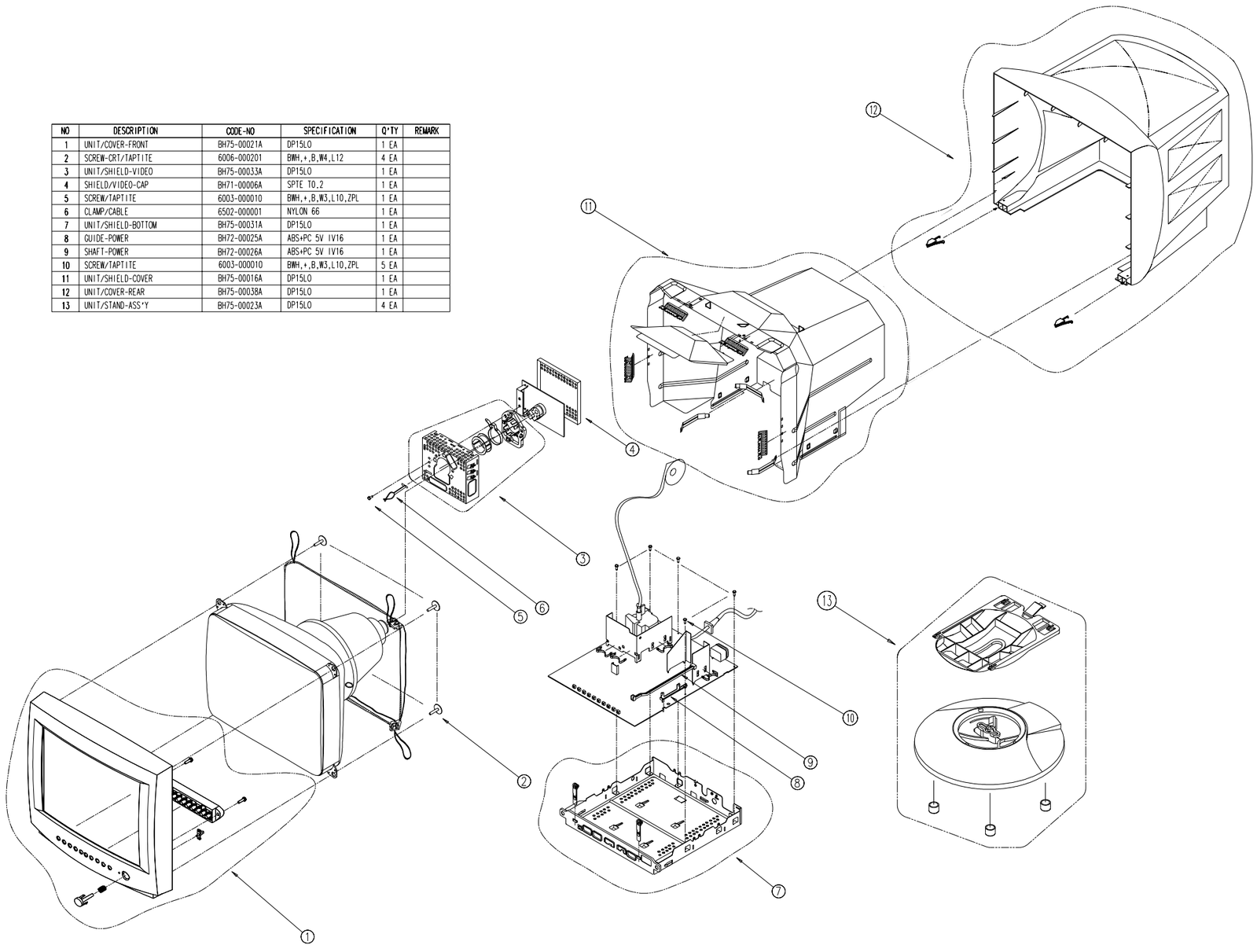
## 7-1 DP14L*

| NO | DESCRIPTION | CODE-NO | SPECIFICATION | Q'TY | REMARK |
|---|---|---|---|---|---|
| 1-1 | UNIT/COVER-FRONT | BH75-00022A | DP14L* | 1 EA | |
| 1-2 | SCREW-CRT/TAPTITE | 6006-000201 | TH,M5,L30 | 4 EA | |
| 1-3 | UNIT/SHIELD-VIDEO | BH75-00033A | DP14L* | 1 EA | |
| 1-4 | SHIELD/VIDEO-CAP | BH71-00006A | DP14L* | 1 EA | |
| 1-5 | SCREW | 6003-000010 | BH M3XL10 | 1 EA | |
| 2-1 | UNIT/SHIELD-BOTTOM | BH75-00031A | DP14L* | 1 EA | |
| 2-2 | GUIDE-POWER | BH72-00025A | PC ABS IV16 | 1 EA | |
| 2-3 | SHAFT-POWER | BH72-00026A | PC ABS IV16 | 1 EA | |
| 2-4 | SCREW | 6003-000010 | BH M3XL10 | 5 EA | |
| 2-5 | PCB | | DP14L* | 1 EA | |
| 3-1 | UNIT/STAND | BH75-00023A | DP14L* | 1 EA | |
| 3-2 | UNIT/COVER-REAR | BH75-00039A | ABS V0 IV16 | 1 EA | |
| 3-3 | LABEL RATING | BH68-30671C | DP14L* PE T0.075 | 1 EA | |



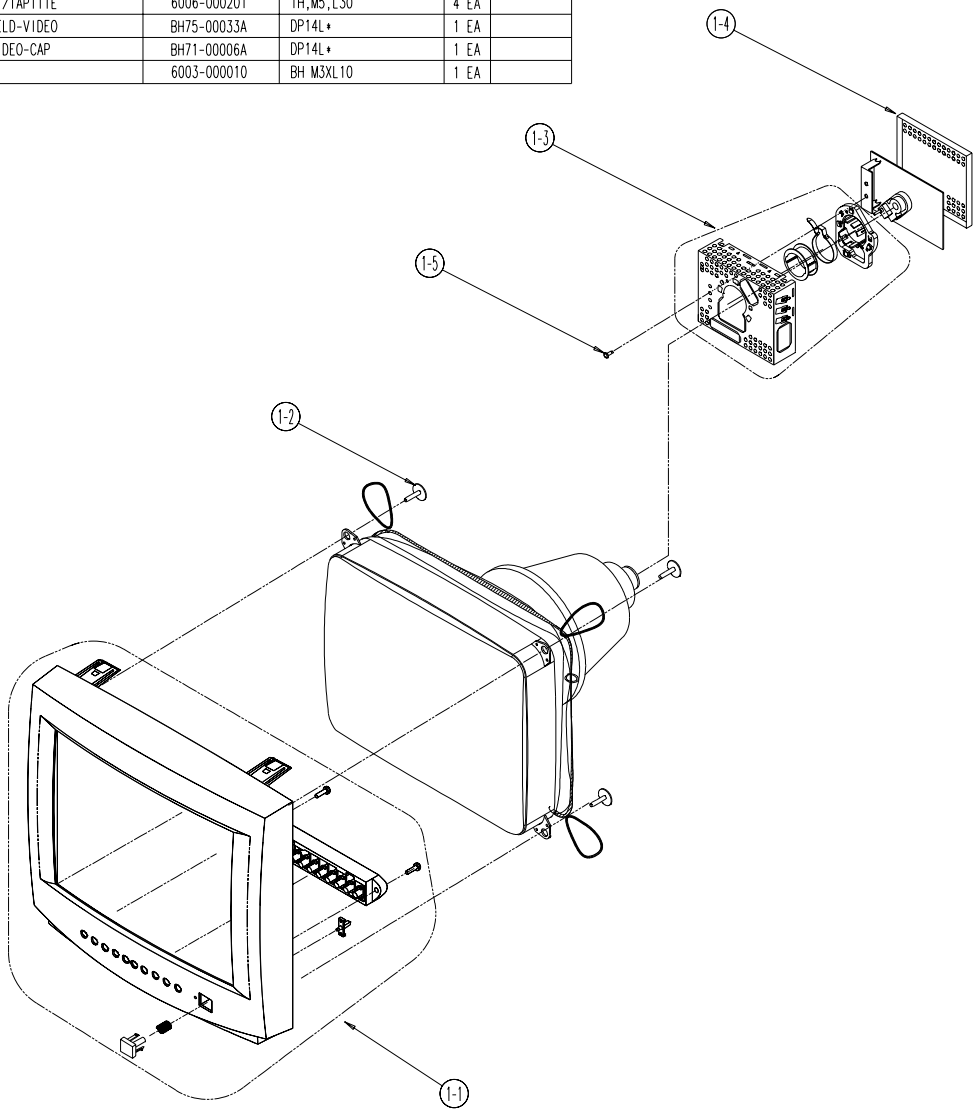
## 7-2 DP15L*

| NO | DESCRIPTION | CODE-NO | SPECIFICATION | Q'TY | REMARK |
|---|---|---|---|---|---|
| 1 | UNIT/COVER-FRONT | BH75-00021A | DP15LO | 1 EA | |
| 2 | SCREW-CRT/TAPTITE | 6006-000201 | BWH,+,B,W4,L12 | 4 EA | |
| 3 | UNIT/SHIELD-VIDEO | BH75-00033A | DP15LO | 1 EA | |
| 4 | SHIELD/VIDEO-CAP | BH71-00006A | SPTE T0.2 | 1 EA | |
| 5 | SCREW/TAPTITE | 6003-000010 | BWH,+,B,W3,L10,ZPL | 1 EA | |
| 6 | CLAMP/CABLE | 6502-000001 | NYLON 66 | 1 EA | |
| 7 | UNIT/SHIELD-BOTTOM | BH75-00031A | DP15LO | 1 EA | |
| 8 | GUIDE-POWER | BH72-00025A | ABS+PC 5V IV16 | 1 EA | |
| 9 | SHAFT-POWER | BH72-00026A | ABS+PC 5V IV16 | 1 EA | |
| 10 | SCREW/TAPTITE | 6003-000010 | BWH,+,B,W3,L10,ZPL | 5 EA | |
| 11 | UNIT/SHIELD-COVER | BH75-00016A | DP15LO | 1 EA | |
| 12 | UNIT/COVER-REAR | BH75-00038A | DP15LO | 1 EA | |
| 13 | UNIT/STAND-ASS'Y | BH75-00023A | DP15LO | 4 EA | |



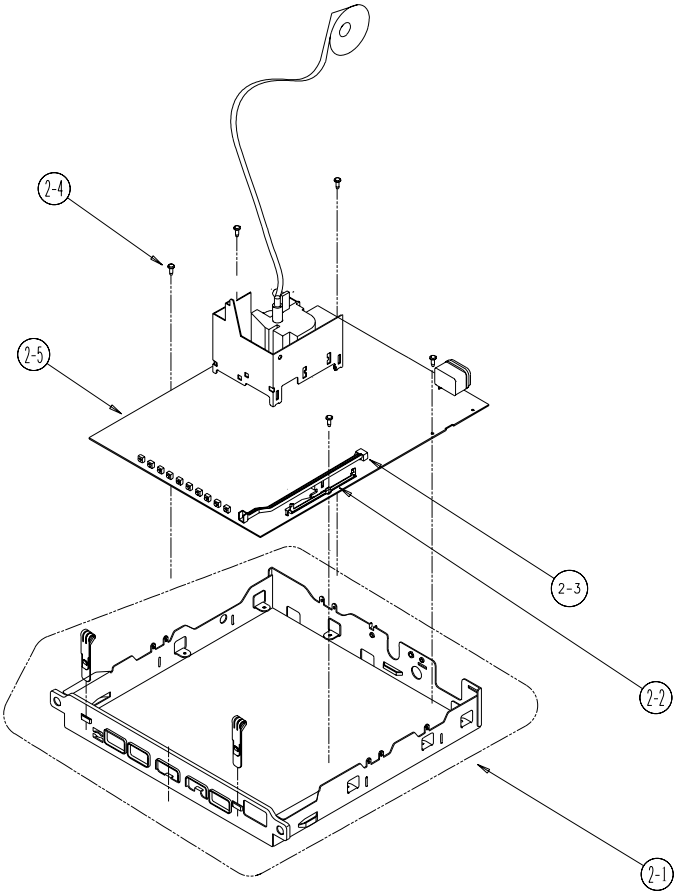
## 7-1-1 Front Cover & CRT Ass'y (DP14L*)

| NO | DESCRIPTION | CODE-NO | SPECIFICATION | Q'TY | REMARK |
|---|---|---|---|---|---|
| 1-1 | UNIT/COVER-FRONT | BH75-00022A | DP14L* | 1 EA | |
| 1-2 | SCREW-CRT/TAPTITE | 6006-000201 | TH,M5,L30 | 4 EA | |
| 1-3 | UNIT/SHIELD-VIDEO | BH75-00033A | DP14L* | 1 EA | |
| 1-4 | SHIELD/VIDEO-CAP | BH71-00006A | DP14L* | 1 EA | |
| 1-5 | SCREW | 6003-000010 | BH M3XL10 | 1 EA | |



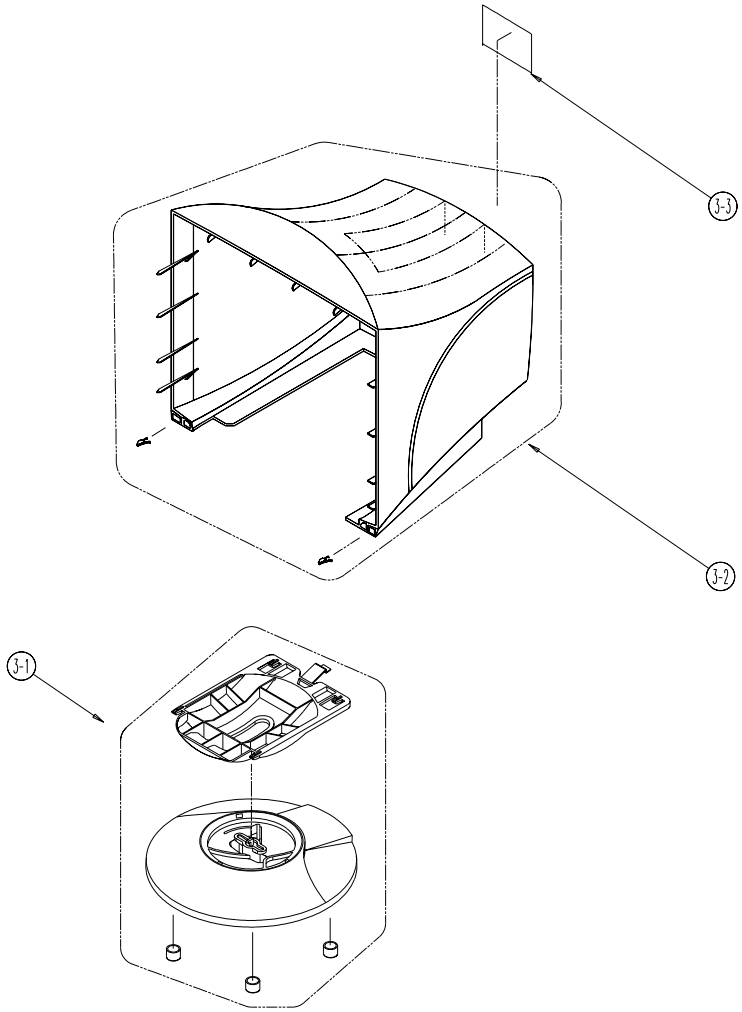
## 7-1-2 Chassis & Stand Ass'y (DP14L*)

| NO | DESCRIPTION | CODE-NO | SPECIFICATION | Q'TY | REMARK |
|---|---|---|---|---|---|
| 2-1 | UNIT/SHIELD-BOTTOM | BH75-00031A | DP14L* | 1 EA | |
| 2-2 | GUIDE-POWER | BH72-00025A | PC ABS IV16 | 1 EA | |
| 2-3 | SHAFT-POWER | BH72-00026A | PC ABS IV16 | 1 EA | |
| 2-4 | SCREW | 6003-000010 | BH M3XL10 | 5 EA | |
| 2-5 | PCB | | DP14L* | 1 EA | |



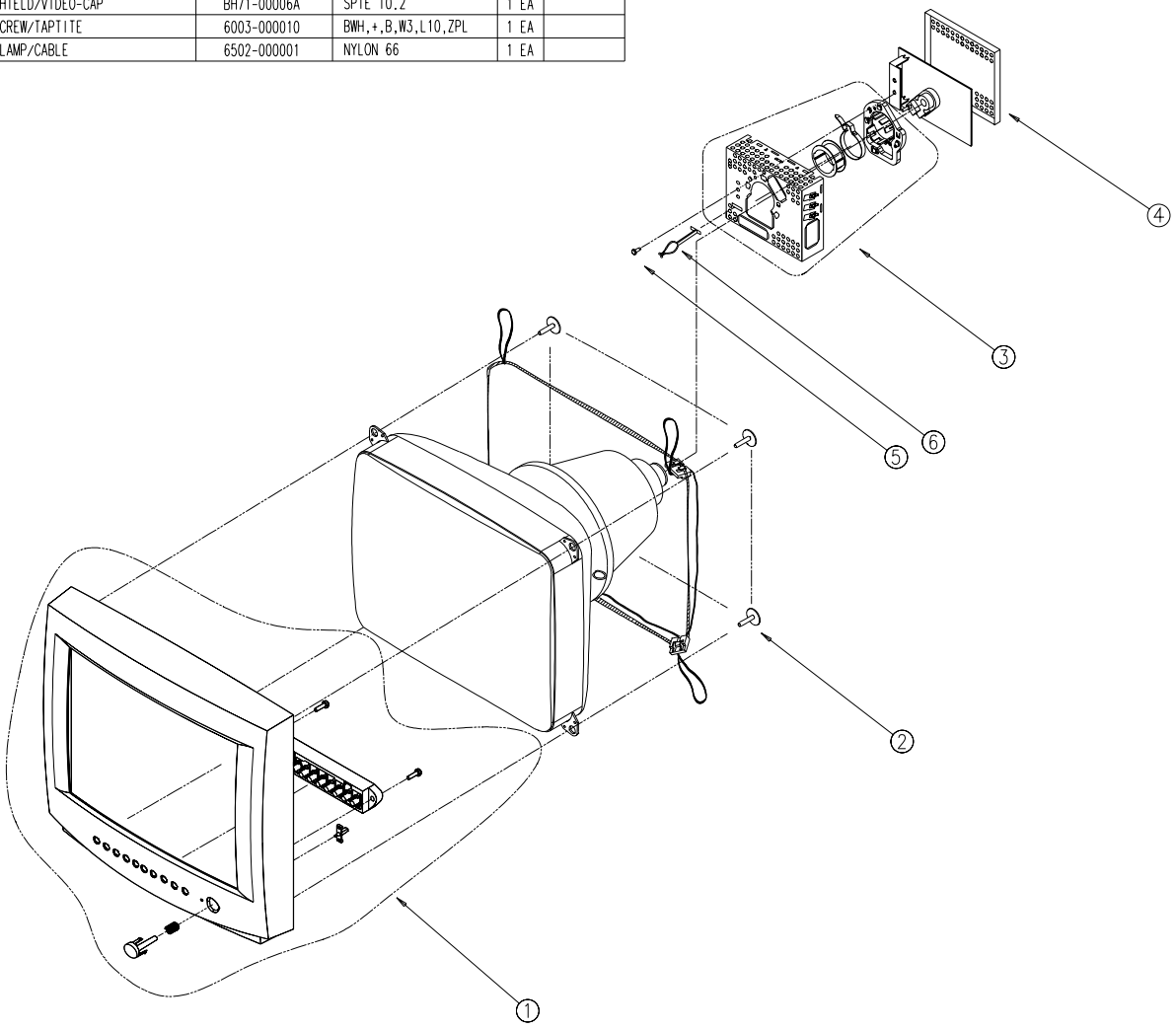
## 7-1-3 Rear Cover Ass'y (DP14L*)

| NO | DESCRIPTION | CODE-NO | SPECIFICATION | Q'TY | REMARK |
|---|---|---|---|---|---|
| 3-1 | UNIT/STAND | BH75-00023A | DP14L* | 1 EA | |
| 3-2 | UNIT/COVER-REAR | BH75-00039A | ABS V0 1V16 | 1 EA | |
| 3-3 | LABEL RATING | BH68-30671C | DP14L* PE T0.075 | 1 EA | |



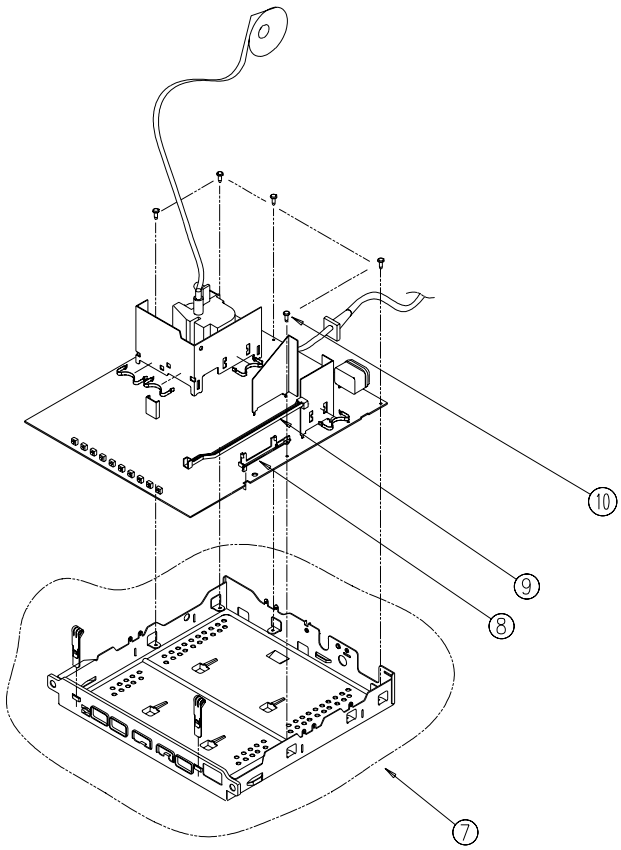
## 7-2-1 Front Cover & CRT Ass'y (DP15L*)

| NO | DESCRIPTION | CODE-NO | SPECIFICATION | Q'TY | REMARK |
|---|---|---|---|---|---|
| 1 | UNIT/COVER-FRONT | BH75-00021A | DP15LO | 1 EA | |
| 2 | SCREW-CRT/TAPTITE | 6006-000201 | BWH,+,B,W4,L12 | 4 EA | |
| 3 | UNIT/SHIELD-VIDEO | BH75-00033A | DP15LO | 1 EA | |
| 4 | SHIELD/VIDEO-CAP | BH71-00006A | SPTE T0.2 | 1 EA | |
| 5 | SCREW/TAPTITE | 6003-000010 | BWH,+,B,W3,L10,ZPL | 1 EA | |
| 6 | CLAMP/CABLE | 6502-000001 | NYLON 66 | 1 EA | |



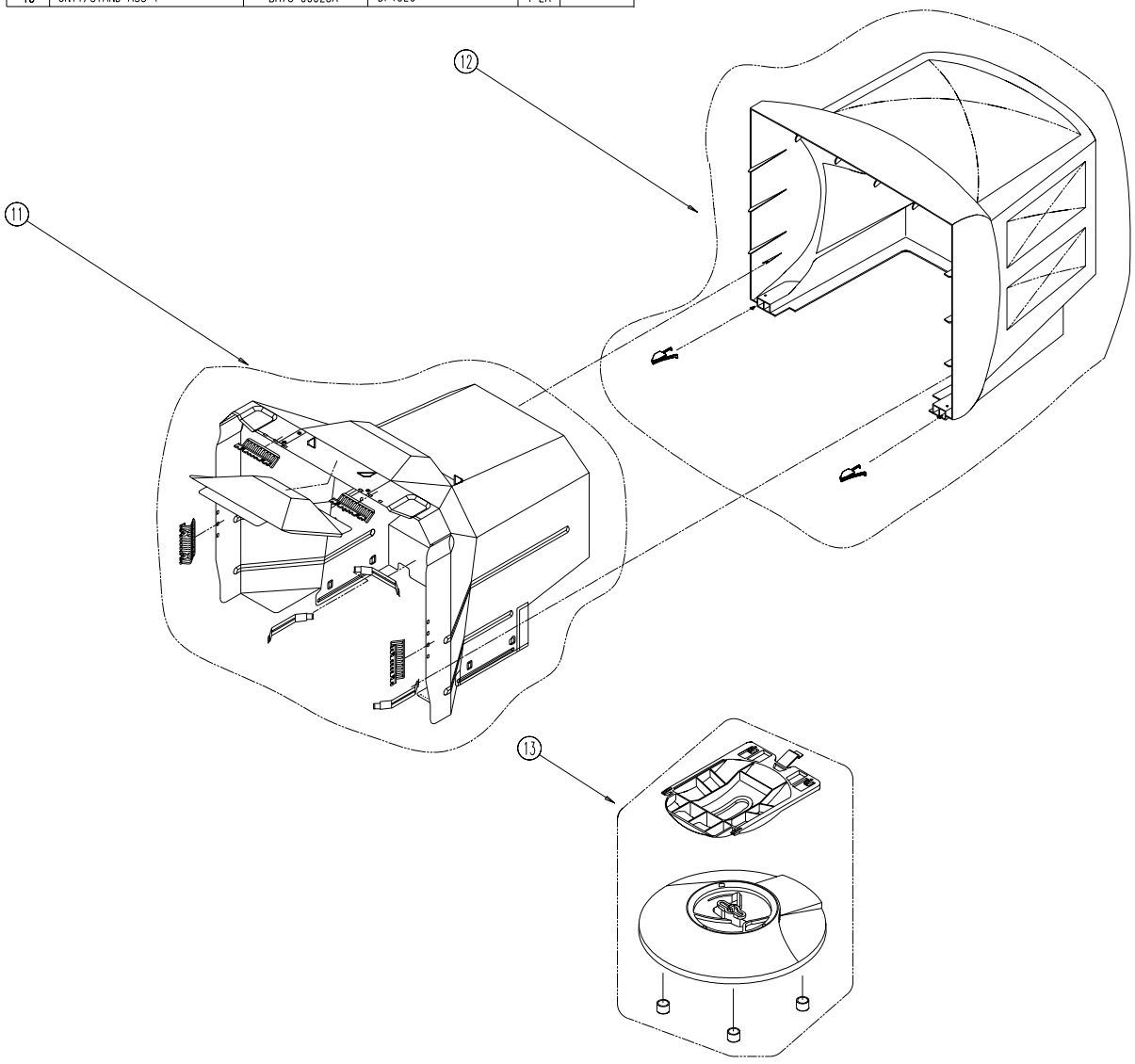
## 7-2-2 Chassis & Stand Ass'y (DP15L*)

| NO | DESCRIPTION | CODE-NO | SPECIFICATION | Q'TY | REMARK |
|---|---|---|---|---|---|
| 7 | UNIT/SHIELD-BOTTOM | BH75-00031A | DP15LO | 1 EA | |
| 8 | GUIDE-POWER | BH72-00025A | ABS+PC 5V IV16 | 1 EA | |
| 9 | SHAFT-POWER | BH72-00026A | ABS+PC 5V IV16 | 1 EA | |
| 10 | SCREW/TAPTITE | 6003-000010 | BWH,+,B,W3,L10,ZPL | 5 EA | |



## 7-2-3 Rear Cover Ass'y (DP15L*)

| NO | DESCRIPTION | CODE-NO | SPECIFICATION | Q'TY | REMARK |
|---|---|---|---|---|---|
| 11 | UNIT/SHIELD-COVER | BH75-00016A | DP15LO | 1 EA | |
| 12 | UNIT/COVER-REAR | BH75-00038A | DP15LO | 1 EA | |
| 13 | UNIT/STAND-ASS'Y | BH75-00023A | DP15LO | 4 EA | |



# 8 Electrical Parts List

## 8-1 Main PCB Parts

| Loc. No. | Code No. | Description | Specification | Remarks |
|---|---|---|---|---|
| BD402 | 3301-000011 | CORE-FERRITE BEAD | AA,3.5x1.0x5.7mm,1500 | |
| BD403 | 3301-000012 | CORE-FERRITE BEAD | AA,3.5x1x9mm,1000,3000 | |
| BD406 | 3301-000011 | CORE-FERRITE BEAD | AA,3.5x1.0x5.7mm,1500 | |
| BD501 | 3301-000012 | CORE-FERRITE BEAD | AA,3.5x1x9mm,1000,3000 | |
| BD502 | 3301-000012 | CORE-FERRITE BEAD | AA,3.5x1x9mm,1000,3000 | |
| BD601 | 3301-000012 | CORE-FERRITE BEAD | AA,3.5x1x9mm,1000,3000 | |
| BD602 | 3301-000012 | CORE-FERRITE BEAD | AA,3.5x1x9mm,1000,3000 | |
| BD603 | 3301-000011 | CORE-FERRITE BEAD | AA,3.5x1.0x5.7mm,1500 | |
| BD604 | 3301-000011 | CORE-FERRITE BEAD | AA,3.5x1.0x5.7mm,1500 | |
| C201 | 2401-000050 | C-AL | 10uF,20%,16V,GP,TP,5x11,2.5 | |
| C203 | 2201-000483 | C-CERAMIC,DISC | 33pF,5%,50V,CH,TP,5x3,5 | |
| C204 | 2201-000483 | C-CERAMIC,DISC | 33pF,5%,50V,CH,TP,5x3,5 | |
| C208 | 2201-000146 | C-CERAMIC,DISC | 100pF,5%,50V,SL,TP,5x3,5 | |
| C209 | 2201-000017 | C-CERAMIC,DISC | 1nF,10%,50V,Y5P,TP,4x3.5 | |
| C210 | 2401-000050 | C-AL | 10uF,20%,16V,GP,TP,5x11,2.5 | |
| C211 | 2401-000050 | C-AL | 10uF,20%,16V,GP,TP,5x11,2.5 | |
| C212 | 2401-000050 | C-AL | 10uF,20%,16V,GP,TP,5x11,2.5 | |
| C213 | 2201-000144 | C-CERAMIC,DISC | 100pF,5%,50V,CH,TP,8x3,5 | |
| C214 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5 | |
| C301 | 2401-000849 | C-AL | 220uF,20%,35V,GP,TP,10x12.5,5 | |
| C302 | 2305-000237 | C-FILM,MPEF | 1uF,5%,63V,TP,7.5x15.5mm,5mm | |
| C303 | 2202-002008 | C-CERAMIC,MLC-AXIAL | 10nF,+80-20%,50V,Y5V | |
| C304 | 2301-000519 | C-FILM,PEF | 3.3nF,5%,100V,TP,5.8x3x12.5,5 | |
| C305 | 2401-000603 | C-AL | 1uF,20%,50V,GP,TP,5x11,5 | |
| C306 | 2301-001027 | C-FILM,PEF | 15nF,10%,250V,TP,9.5x12x4.5,5 | |
| C309 | 2401-000050 | C-AL | 10uF,20%,16V,GP,TP,5x11,2.5 | |
| C310 | 2201-000558 | C-CERAMIC,DISC | 470pF,10%,50V,Y5P,TP,5x3 | |
| C401 | 2301-000016 | C-FILM,PEF | 22nF,5%,100V,TP,7.2x4.5x9.0mm | |
| C402 | 2201-000573 | C-CERAMIC,DISC | 47pF,5%,50V,CH,TP,6.5x3.0 | |
| C403 | 2301-000016 | C-FILM,PEF | 22nF,5%,100V,TP,7.2x4.5x9.0mm | |
| C404 | 2202-002021 | C-CERAMIC,MLC-RADIAL | 1nF,5%,50V,NPO,TP,5 | |
| C405 | 2401-002075 | C-AL | 4.7uF,20%,50V,GP,TP,5x11,5 | |
| C406 | 2301-000174 | C-FILM,PEF | 15nF,5%,100V,TP,7.2x4.0x7.5mm | |
| C407 | 2401-000603 | C-AL | 1uF,20%,50V,GP,TP,5x11,5 | |
| C408 | 2301-000004 | C-FILM,PEF | 2.2nF,5%,100V,TP,5.5X10X2.9,5 | |
| C409 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5 | |
| C410 | 2401-000031 | C-AL | 47uF,20%,16V,GP,TP,5x11,5 | |
| C412 | 2301-000016 | C-FILM,PEF | 22nF,5%,100V,TP,7.2x4.5x9.0mm | |
| C413 | 2201-000471 | C-CERAMIC,DISC | .33NF,10%,50V,Y5P,TP,4X3M | ⚠ |
| C414 | 2201-000863 | C-CERAMIC,DISC | 680pF,10%,50V,Y5P,TP,5x3 | |
| C415 | 2401-000042 | C-AL | 100uF,20%,16V,GP,TP,6.3x7,5 | |
| C416 | 2401-000042 | C-AL | 100uF,20%,16V,GP,TP,6.3x7,5 | |
| C417 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5 | |
| C418 | 2301-000168 | C-FILM,PEF | 150nF,5%,100V,TP,11.5x19mm,7 | |
| C419 | 2305-000412 | C-FILM,MPEF | 470nF,5%,63V,TP,5mm | |

| Loc. No. | Code No. | Description | Specification | Remarks |
|---|---|---|---|---|
| C420 | 2401-001509 | C-AL | 47uF,20%,16V,GP,TP,5x7,2.5mm | |
| C421 | 2401-001515 | C-AL | 47uF,20%,16V,WT,TP,6.3x11,5 | |
| C422 | 2401-000603 | C-AL | 1uF,20%,50V,GP,TP,5x11,5 | |
| C423 | 2301-000004 | C-FILM,PEF | 2.2nF,5%,100V,TP,5.5X10X2.9,5 | |
| C424 | 2401-000887 | C-AL | 220uF,20%,63V,GP,TP,10x20,5 | |
| C425 | 2301-000005 | C-FILM,PEF | 33nF,5%,100V,TP,5.8x12.5x3,5 | |
| C426 | 2301-001207 | C-FILM,PPF | 5.2nF,5%,2.5KV,BK,29x21.5x13 | ⚠ |
| C427 | 2201-000291 | C-CERAMIC,DISC | 1nF,10%,500V,Y5P,TP,8.5x5 | |
| C428 | 2401-000028 | C-AL | 10uF,20%,50V,GP,TP,5x11,5 | |
| C429 | 2401-000028 | C-AL | 10uF,20%,50V,GP,TP,5x11,5 | |
| C430 | 2401-000603 | C-AL | 1uF,20%,50V,GP,TP,5x11,5 | |
| C431 | 2301-001125 | C-FILM,MPPF | 600nF,5%,250V,TP,26x20x11.5 | |
| C432 | 2401-000603 | C-AL | 1uF,20%,50V,GP,TP,5x11,5 | |
| C433 | 2306-000164 | C-FILM,MPPF | 220nF,5%,250V,TP,19x22x10,7 | |
| C434 | 2306-000007 | C-FILM,MPPF | 470nF,5%,250V,BK,26x18.5x10 | |
| C435 | 2201-000471 | C-CERAMIC,DISC | .33NF,10%,50V,Y5P,TP,4X3M | |
| C437 | 2301-000004 | C-FILM,PEF | 2.2nF,5%,100V,TP,5.5X10X2.9,5 | |
| C438 | 2401-001012 | C-AL | 3.3UF,20%,50V,BP,TP,16X25,7.5 | |
| C439 | 2303-001029 | C-FILM,PPF | 5.2nF,5%,630V,TP,19x7x13,7.5 | |
| C440 | 2201-000326 | C-CERAMIC,DISC | 2.2nF,10%,50V,Y5P,TP,6.5x | |
| C501 | 2201-000017 | C-CERAMIC,DISC | 1nF,10%,50V,Y5P,TP,4x3.5 | |
| C502 | 2201-000471 | C-CERAMIC,DISC | .33NF,10%,50V,Y5P,TP,4X3M | |
| C503 | 2201-000017 | C-CERAMIC,DISC | 1nF,10%,50V,Y5P,TP,4x3.5 | |
| C504 | 2401-000059 | C-AL | 220nF,20%,50V,GP,5x11,5 | ⚠ |
| C506 | 2401-002267 | C-AL | 2.2uF,20%,250V,GP,TP,8x11.5,5 | |
| C507 | 2401-003448 | C-AL | 150UF,20%,100V,GP,TP,10X20MM,5 | |
| C508 | 2201-000409 | C-CERAMIC,DISC | 270pF,10%,500V,Y5P,TP,6x4 | |
| C509 | 2306-000007 | C-FILM,MPPF | 470nF,5%,250V,BK,26x18.5x10 | |
| C510 | 2301-000168 | C-FILM,PEF | 150nF,5%,100V,TP,11.5x19mm,7 | |
| C511 | 2401-000603 | C-AL | 1uF,20%,50V,GP,TP,5x11,5 | |
| C512 | 2301-000174 | C-FILM,PEF | 15nF,5%,100V,TP,7.2x4.0x7.5mm | |
| C513 | 2401-000010 | C-AL | 220uF,20%,16V,GP,6.3x11mm,2 | |
| C601 | 2301-001195 | C-FILM,MPPF | 150nF,10%,275VAC,BK,26x16.5x | ⚠ |
| C602 | 2301-001195 | C-FILM,MPPF | 150nF,10%,275VAC,BK,26x16.5xq | ⚠ |
| C603 | 2201-000023 | C-CERAMIC,DISC | 2.2nF,20%,125V,Y5U,TP,11x | ⚠ |
| C604 | 2201-000023 | C-CERAMIC,DISC | 2.2nF,20%,125V,Y5U,TP,11x | ⚠ |
| C606 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5 | |
| C607 | 2401-003119 | C-AL | 150uF,20%,400V,GP,BK,25.4x30,1 | ⚠ |
| C608 | 2401-000966 | C-AL | 22uF,20%,50V,GP,TP,5x11,5 | |
| C609 | 2301-000284 | C-FILM,PEF | 47nF,5%,100V,TP,8.5x12.5mm,5m | |
| C610 | 2201-000019 | C-CERAMIC,DISC | 10nF,+80-20%,500V,Y5V,TP | |
| C611 | 2201-000012 | C-CERAMIC,DISC | 220pF,10%,1KV,Y5P,TP,6x5 | |
| C612 | 2401-001551 | C-AL | 47uF,20%,35V,GP,TP,6.3x11,5 | |
| C613 | 2401-000603 | C-AL | 1uF,20%,50V,GP,TP,5x11,5 | |
| C614 | 2301-000010 | C-FILM,PEF | 100nF,5%,100V,TP,11.5x12.5mm | |
| C615 | 2401-002299 | C-AL | 4.7uF,20%,50V,GP,TP,5x7,5 | |
| C618 | 2201-000023 | C-CERAMIC,DISC | 2.2nF,20%,125V,Y5U,TP,11x | ⚠ |

| Loc. No. | Code No. | Description | Specification | Remarks |
|---|---|---|---|---|
| C619 | 2201-000023 | C-CERAMIC,DISC | 2.2nF,20%,125V,Y5U,TP,11x | ⚠ |
| C620 | 2401-000039 | C-AL | 1000uF,20%,16V,GP,TP,10x16,5 | |
| C621 | 2201-000469 | C-CERAMIC,DISC | 330pF,10%,500V,Y5P,TP,6x4 | |
| C622 | 2401-001551 | C-AL | 47uF,20%,35V,GP,TP,6.3x11,5 | |
| C623 | 2401-000058 | C-AL | 220UF,20%,100V,GP,TP,10X20MM,5 | |
| C624 | 2401-000039 | C-AL | 1000uF,20%,16V,GP,TP,10x16,5 | |
| C626 | 2401-000039 | C-AL | 1000uF,20%,16V,GP,TP,10x16,5 | |
| C628 | 2401-000042 | C-AL | 100uF,20%,16V,GP,TP,6.3x7,5 | |
| C629 | 2401-000031 | C-AL | 47uF,20%,16V,GP,TP,5x11,5 | |
| C630 | 2401-000039 | C-AL | 1000uF,20%,16V,GP,TP,10x16,5 | |
| C631 | 2201-000291 | C-CERAMIC,DISC | 1nF,10%,500V,Y5P,TP,8.5x5 | |
| CN201 | 3711-003873 | CONNECTOR-HEADER | BOX,7P,1R,2mm,STRAIGHT | |
| CN202 | 3711-003845 | CONNECTOR-HEADER | BOX,11P,1R,2mm,STRAIGHT | |
| CN303 | 3711-000197 | CONNECTOR-HEADER | 1WALL,3P,1R,2.5mm,STRAI | |
| CN502 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| CN503 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| CN601 | 3721-001028 | PLUG-AC POWER | 3P,NI | ⚠ |
| D201 | 0403-000005 | DIODE-ZENER | UZ5.1B,4.8-5.4V,500mW,DO-35 | |
| D202 | 0403-000005 | DIODE-ZENER | UZ5.1B,4.8-5.4V,500mW,DO-35 | |
| D203 | 0403-000005 | DIODE-ZENER | UZ5.1B,4.8-5.4V,500mW,DO-35 | |
| D204 | 0403-000005 | DIODE-ZENER | UZ5.1B,4.8-5.4V,500mW,DO-35 | |
| D205 | 0403-000005 | DIODE-ZENER | UZ5.1B,4.8-5.4V,500mW,DO-35 | |
| D301 | 0402-000274 | DIODE-RECTIFIER | UF4004,400V,1A,DO-41,TP | |
| D401 | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D404 | 0402-000128 | DIODE-RECTIFIER | 1N4002GP,100V,1A,DO-41,T | |
| D405 | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D406 | 0402-001252 | DIODE-RECTIFIER | DG3L,1500V,3A,DG3,BK | |
| D407 | 0402-001257 | DIODE-RECTIFIER | DTV32F,1500V,15A,TO-220A | |
| D408 | 0402-001118 | DIODE-RECTIFIER | UF1G,400V,1.2A,DO-204AL | |
| D409 | 0402-000007 | DIODE-RECTIFIER | 1N4937GP,600V,1A,DO-41,T | |
| D410 | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D411 | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D412 | 0402-000006 | DIODE-RECTIFIER | 1N4007GP,1000V,1A,DO-41 | |
| D413 | 0402-000006 | DIODE-RECTIFIER | 1N4007GP,1000V,1A,DO-41 | |
| D414 | 0402-001112 | DIODE-RECTIFIER | MDV04-600,600V,4A,DO-201 | |
| D501 | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D502 | 0403-001247 | DIODE-ZENER | UZ24BH,24V,24.2-25.7V,500mW | |
| D503 | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D504 | 0402-000546 | DIODE-RECTIFIER | TVR10G,400V,1.0A,DO-41,T | |
| D505 | 0401-000006 | DIODE-SWITCHING | BAV21,250V,250mA,DO-35,T | |
| D506 | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D507 | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D508 | 0403-000007 | DIODE-ZENER | UZ6.2BM,6.2V,6.0-6.4V,500mW | |
| D515 | 0402-001118 | DIODE-RECTIFIER | UF1G,400V,1.2A,DO-204AL | |
| D5V | 0403-000005 | DIODE-ZENER | UZ5.1B,4.8-5.4V,500mW,DO-35 | |
| D601 | 0402-000103 | DIODE-BRIDGE | D2SBA60,600V,1.5A,SIP-4,ST | ⚠ |

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| D602 | 0402-000012 | DIODE-RECTIFIER | UF4007,1KV,1A,DO-41,TP | |
| D603 | 0402-000546 | DIODE-RECTIFIER | TVR10G,400V,1.0A,DO-41,T | |
| D604 | 0402-000012 | DIODE-RECTIFIER | UF4007,1KV,1A,DO-41,TP | |
| D605 | 0402-000546 | DIODE-RECTIFIER | TVR10G,400V,1.0A,DO-41,T | |
| D606 | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D607 | 0403-000361 | DIODE-ZENER | UZ6.2BSB,6.2V,5.99-6.24V,500 | |
| D608 | 0402-000546 | DIODE-RECTIFIER | TVR10G,400V,1.0A,DO-41,T | |
| D609 | 0402-001118 | DIODE-RECTIFIER | UF1G,400V,1.2A,DO-204AL | |
| D610 | 0402-000012 | DIODE-RECTIFIER | UF4007,1KV,1A,DO-41,TP | |
| D611 | 0402-000005 | DIODE-RECTIFIER | 31DF4,400V,3A,DO-201AD,B | |
| D612 | 0402-000546 | DIODE-RECTIFIER | TVR10G,400V,1.0A,DO-41,T | |
| D613 | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D614 | 0403-000007 | DIODE-ZENER | UZ6.2BM,6.2V,6.0-6.4V,500mW | |
| D615 | 0403-000007 | DIODE-ZENER | UZ6.2BM,6.2V,6.0-6.4V,500mW | |
| D616 | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D617 | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| FH601 | 3602-000001 | FUSE-CLIP | 30mohm | ⚠ |
| FUSE | 3601-000004 | FUSE-FERRULE | 250V,3.15A,SB,CERAMIC,5x20m | |
| GT301 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| GT302 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| GT601 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| GT602 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| GT603 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| GT604 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| HS501 | BH99-00001A | ASSY,HEAT/SINK | H/S FBT,SPRING,KA5802,DTV | |
| IC201 | BH09-00005A | IC-MICROCONTROLLER | DM024,DA,01 | |
| IC201_SOCK | 3704-001071 | SOCKET-IC | 42P,DIP,SN,1.778mm | |
| IC202 | 1203-000495 | IC-RESET | 7045,T0-92,3P,PLASTIC,4.3/4 | |
| IC203 | 1103-001149 | IC-EEPROM | 24C041,4KBIT,DIP,8P,300MIL,10M | |
| IC301 | 1204-001508 | IC-VERTICAL DEF. | KA2142,SIP,10P,PLASTI | |
| IC401 | 1204-001512 | IC-DEF. PROCESSOR | STV7779,SDIP,32P,300MI | ⚠ |
| IC601 | BH13-00004A | IC-HYBRID | DP104C,TO-220-5L,5P,POWER SW | ⚠ |
| IC602 | 1203-000001 | IC-POSI.FIXED REG. | 7805,TO-220,3P,PLAS | |
| L401 | BH27-20345D | COIL-HOR LINEARITY | 5.2uH+/-1.5uH,DR141 | |
| L402 | BH27-00008A | COIL-LINE FILTER | 200UH,10%,AR 0630,BULK | |
| L403 | 2701-000154 | INDUCTOR-AXIAL | 220uH,10%,4.2x9.8mm | |
| L404 | BH27-20342U | COIL-CHOKE | 8.2MH(AT250KHz),10%,DR8*11,BU | |
| L501 | BH27-00008A | COIL-LINE FILTER | 200UH,10%,AR 0630,BULK | |
| L601 | BH27-00007A | COIL-LINE FILTER | 25MH MIN,SQE 2424,BUL | ⚠ |
| OP201 | 0601-001147 | LED | ROUND,GRN,4.75mm,565nm | |
| Q301 | 0501-000586 | TR-SMALL SIGNAL | KSC945,NPN,250mW,TO-92,T | |
| Q401 | 0501-000369 | TR-SMALL SIGNAL | KSC2331-Y,NPN,1W,TO-92L | ⚠ |
| Q402 | 0502-001129 | TR-POWER | KSC5802,NPN,70W,TO-3PF,ST,5 | |
| Q403 | 0501-000586 | TR-SMALL SIGNAL | KSC945,NPN,250mW,TO-92,T | |
| Q404 | 0501-000303 | TR-SMALL SIGNAL | KSA733,PNP,250mW,TO-92,T | |
| Q405 | 0501-000586 | TR-SMALL SIGNAL | KSC945,NPN,250mW,TO-92,T | |
| Q406 | 0505-001309 | FET-SILICON | IRF630,N,200V,10A,0.4OHM,100 | |

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| Q407 | 0501-000586 | TR-SMALL SIGNAL | KSC945,NPN,250mW,TO-92,T | |
| Q408 | 0505-001309 | FET-SILICON | IRF630,N,200V,10A,0.4OHM,100 | |
| Q409 | 0501-000303 | TR-SMALL SIGNAL | KSA733,PNP,250mW,TO-92,T | |
| Q410 | 0501-000303 | TR-SMALL SIGNAL | KSA733,PNP,250mW,TO-92,T | |
| Q411 | 0501-000586 | TR-SMALL SIGNAL | KSC945,NPN,250mW,TO-92,T | |
| Q412 | 0502-000465 | TR-POWER | KTD2058-Y,NPN,25W,TO-220IS,ST | |
| Q501 | 0501-000143 | TR-SMALL SIGNAL | 2N6520,PNP,625mW,TO-92 | |
| Q502 | 0501-000586 | TR-SMALL SIGNAL | KSC945,NPN,250mW,TO-92,T | |
| Q503 | 0501-000303 | TR-SMALL SIGNAL | KSA733,PNP,250mW,TO-92,T | |
| Q504 | 0505-001309 | FET-SILICON | IRF630,N,200V,10A,0.4OHM,100 | |
| Q510 | 0501-000122 | TR-SMALL SIGNAL | 2N3904,NPN,625mW,TO-92,T | |
| Q601 | 0501-000586 | TR-SMALL SIGNAL | KSC945,NPN,250mW,TO-92,T | |
| Q602 | 0501-000122 | TR-SMALL SIGNAL | 2N3904,NPN,625mW,TO-92,T | |
| Q603 | 0501-000321 | TR-SMALL SIGNAL | KSB1116-Y,PNP,0.75W,TO-9 | |
| Q604 | 0501-000586 | TR-SMALL SIGNAL | KSC945,NPN,250mW,TO-92,T | |
| Q605 | 0501-000321 | TR-SMALL SIGNAL | KSB1116-Y,PNP,0.75W,TO-9 | |
| Q606 | 0501-000586 | TR-SMALL SIGNAL | KSC945,NPN,250mW,TO-92,T | |
| Q607 | 0501-000586 | TR-SMALL SIGNAL | KSC945,NPN,250mW,TO-92,T | |
| Q608 | 0501-002228 | TR-SMALL SIGNAL | KTA1281,PNP,1000MW,TO-92 | |
| R201 | 2001-000869 | R-CARBON | 56OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R202 | 2001-000554 | R-CARBON | 270OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R203 | 2001-000554 | R-CARBON | 270OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R204 | 2001-000869 | R-CARBON | 56OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R205 | 2001-000869 | R-CARBON | 56OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R206 | 2001-000515 | R-CARBON | 220OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R207 | 2001-000515 | R-CARBON | 220OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R208 | 2001-000515 | R-CARBON | 220OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R209 | 2001-000515 | R-CARBON | 220OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R213 | 2001-000786 | R-CARBON | 47KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R214 | 2001-000786 | R-CARBON | 47KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R221 | 2001-000591 | R-CARBON | 3.3KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R222 | 2001-000591 | R-CARBON | 3.3KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R223 | 2001-000869 | R-CARBON | 56OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R224 | 2001-000869 | R-CARBON | 56OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R225 | 2001-000435 | R-CARBON | 1MOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R226 | 2001-000290 | R-CARBON | 10KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R227 | 2001-000515 | R-CARBON | 220OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R228 | 2001-000869 | R-CARBON | 56OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R229 | 2001-000869 | R-CARBON | 56OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R230 | 2001-000005 | R-CARBON | 390OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R231 | 2001-000290 | R-CARBON | 10KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R232 | 2001-000869 | R-CARBON | 56OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R233 | 2001-000869 | R-CARBON | 56OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R234 | 2001-000281 | R-CARBON | 100OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R235 | 2001-000429 | R-CARBON | 1KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R236 | 2001-000290 | R-CARBON | 10KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R237 | 2001-000290 | R-CARBON | 10KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |

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| R238 | 2001-000411 | R-CARBON | 18KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R239 | 2001-000290 | R-CARBON | 10KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R240 | 2001-000290 | R-CARBON | 10KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R241 | 2001-000290 | R-CARBON | 10KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R301 | 2004-000284 | R-METAL | 12Kohm,1%,1/4W,AA,TP,2.4x6.4mm | |
| R303 | 2001-000016 | R-CARBON(S) | 1OHM,5%,1/2W,AA,TP,2.4X6.4MM | |
| R304 | 2004-001023 | R-METAL | 5.6Kohm,1%,1/8W,AA,TP,1.8x3.2m | |
| R305 | 2001-001107 | R-CARBON(S) | 220ohm,5%,1/2W,AA,TP,2.4x6.4 | |
| R306 | 2001-003192 | R-CARBON(S) | 0.82OHM,5%,1/2W,AA,TP,2.4X6 | |
| R307 | 2001-000577 | R-CARBON | 2KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R308 | 2001-000331 | R-CARBON | 12KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R310 | 2001-000411 | R-CARBON | 18KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R311 | 2001-000702 | R-CARBON | 39KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R312 | 2001-000812 | R-CARBON | 5.6KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R313 | 2001-000290 | R-CARBON | 10KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R314 | 2001-000734 | R-CARBON | 4.7KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R401 | 2001-000429 | R-CARBON | 1KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R402 | 2001-000429 | R-CARBON | 1KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R403 | 2004-001137 | R-METAL | 6.8Kohm,1%,1/8W,AA,TP,1.8x3.2m | |
| R404 | 2001-000449 | R-CARBON | 2.2KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R406 | 2001-000006 | R-CARBON | 2.4KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R407 | 2001-000273 | R-CARBON | 100KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R408 | 2001-000435 | R-CARBON | 1MOHM,5%,1/8W,AA,TP,1.8X3.2MM | ⚠ |
| R409 | 2001-000241 | R-CARBON | 1.5KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R410 | 2001-000869 | R-CARBON | 56OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R411 | 2001-000869 | R-CARBON | 56OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R412 | 2001-000042 | R-CARBON | 1KOHM,5%,1/4W,AA,TP,2.4X6.4MM | |
| R413 | 2001-000290 | R-CARBON | 10KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R414 | 2001-000645 | R-CARBON | 330KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R415 | 2001-001072 | R-CARBON(S) | 12OHM,5%,1/2W,AA,TP,2.4X6.4M | |
| R416 | 2003-000009 | R-METAL OXIDE(S) | 220ohm,5%,1W,AA,TP,3.3x | ⚠ |
| R417 | 2001-000405 | R-CARBON | 180OHM,5%,1/8W,AA,TP,1.8X3.2MM | ⚠ |
| R418 | 2001-000429 | R-CARBON | 1KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R419 | 2001-000016 | R-CARBON(S) | 1OHM,5%,1/2W,AA,TP,2.4X6.4MM | |
| R421 | 2001-000110 | R-CARBON | 10OHM,5%,1/4W,AA,TP,2.4X6.4MM | |
| R422 | 2001-001053 | R-CARBON(S) | 1.5OHM,5%,1/2W,AA,TP,2.4X6.4 | |
| R423 | 2003-000009 | R-METAL OXIDE(S) | 220ohm,5%,1W,AA,TP,3.3x | |
| R424 | 2001-000211 | R-CARBON | 1OHM,5%,1/4W,AA,TP,2.4X6.4MM | |
| R425 | 2001-000429 | R-CARBON | 1KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R426 | 2001-000281 | R-CARBON | 100OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R427 | 2001-000290 | R-CARBON | 10KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R428 | 2001-000449 | R-CARBON | 2.2KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R429 | 2001-000076 | R-CARBON | 47KOHM,5%,1/4W,AA,TP,2.4X6.4MM | |
| R430 | 2001-000435 | R-CARBON | 1MOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R431 | 2001-000290 | R-CARBON | 10KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R432 | 2001-000290 | R-CARBON | 10KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R433 | 2001-000076 | R-CARBON | 47KOHM,5%,1/4W,AA,TP,2.4X6.4MM | |

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|---|---|---|---|---|
| R434 | 2001-000435 | R-CARBON | 1MOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R435 | 2001-000273 | R-CARBON | 100KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R436 | 2001-000356 | R-CARBON | 150KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R437 | 2001-000009 | R-CARBON | 20KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R438 | 2001-000721 | R-CARBON | 4.3KOHM,5%,1/4W,AA,TP,2.4X6.4MM | |
| R439 | 2004-000327 | R-METAL | 150Kohm,1%,1/4W,AA,TP,2.4x6.4m | |
| R440 | 2001-000591 | R-CARBON | 3.3KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R441 | 2001-000864 | R-CARBON | 56KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R442 | 2001-000241 | R-CARBON | 1.5KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R501 | 2001-000331 | R-CARBON | 12KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R502 | 2001-000947 | R-CARBON | 7.5KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R503 | 2001-000449 | R-CARBON | 2.2KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R504 | 2001-000331 | R-CARBON | 12KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R505 | 2001-000591 | R-CARBON | 3.3KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R506 | 2001-000702 | R-CARBON | 39KOHM,5%,1/8W,AA,TP,1.8X3.2MM | ⚠ |
| R507 | 2004-004095 | R-METAL | 2.36Kohm,1%,1/4W,AA,TP,2.4x6.4 | ⚠ |
| R508 | 2004-000284 | R-METAL | 12Kohm,1%,1/4W,AA,TP,2.4x6.4mm | ⚠ |
| R509 | 2001-000645 | R-CARBON | 330KOHM,5%,1/8W,AA,TP,1.8X3.2MM | ⚠ |
| R510 | 2004-000716 | R-METAL | 3.6Kohm,1%,1/4W,AA,TP,2.4x6.4m | ⚠ |
| R511 | 2001-000591 | R-CARBON | 3.3KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R513 | 2001-000084 | R-CARBON | 100KOHM,5%,1/4W,AA,TP,2.4X6.4MM | |
| R514 | 2001-000454 | R-CARBON | 2.2MOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R515 | 2001-000087 | R-CARBON(S) | 120KOHM,5%,1/2W,AA,TP,2.4X6 | ⚠ |
| R516 | 2001-000096 | R-CARBON(S) | 1MOHM,5%,1/2W,AA,TP,2.4X6.4M | ⚠ |
| R517 | 2001-000016 | R-CARBON(S) | 1OHM,5%,1/2W,AA,TP,2.4X6.4MM | |
| R518 | 2001-000290 | R-CARBON | 10KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R519 | 2001-001099 | R-CARBON(S) | 2.7KOHM,5%,1/2W,AA,TP,2.4X6 | |
| R520 | 2001-000110 | R-CARBON | 10OHM,5%,1/4W,AA,TP,2.4X6.4MM | |
| R521 | 2001-000016 | R-CARBON(S) | 1OHM,5%,1/2W,AA,TP,2.4X6.4MM | |
| R522 | 2001-001197 | R-CARBON(S) | 910OHM,5%,1/2W,AA,TP,2.4X6.4 | |
| R523 | 2001-000522 | R-CARBON | 22KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R524 | 2001-000786 | R-CARBON | 47KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R525 | 2001-000539 | R-CARBON | 24KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R526 | 2001-000850 | R-CARBON | 560KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R527 | 2001-001000 | R-CARBON | 82KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R528 | 2001-000011 | R-CARBON | 75KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R529 | 2001-000244 | R-CARBON | 1.5MOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R530 | 2001-000429 | R-CARBON | 1KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R531 | 2001-000004 | R-CARBON | 200KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R532 | 2001-000016 | R-CARBON(S) | 1OHM,5%,1/2W,AA,TP,2.4X6.4MM | |
| R601 | 2001-000643 | R-CARBON | 330KOHM,5%,1/4W,AA,TP,2.4X6.4MM | ⚠ |
| R602 | 2001-000643 | R-CARBON | 330KOHM,5%,1/4W,AA,TP,2.4X6.4MM | |
| R603 | 2001-000924 | R-CARBON | 680OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R604 | 2001-000857 | R-CARBON | 560OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R605 | 2001-000281 | R-CARBON | 100OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R606 | 2003-000495 | R-METAL OXIDE(S) | 150Kohm,5%,1W,AA,TP,3.3 | |
| R607 | 2003-000495 | R-METAL OXIDE(S) | 150Kohm,5%,1W,AA,TP,3.3 | |

| Loc. No. | Code No. | Description | Specification | Remarks |
|---|---|---|---|---|
| R608 | 2001-000734 | R-CARBON | 4.7KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R609 | 2003-000738 | R-METAL OXIDE(S) | 56Kohm,5%,2W,AA,TP,4x12 | |
| R610 | 2003-000507 | R-METAL OXIDE(S) | 15Kohm,5%,1W,AA,TP,3.3x | |
| R611 | 2001-001163 | R-CARBON(S) | 560OHM,5%,1/2W,AA,TP,2.4X6.4 | |
| R612 | 2001-001117 | R-CARBON(S) | 2KOHM,5%,1/2W,AA,TP,2.4X6.4M | |
| R613 | 2003-000471 | R-METAL OXIDE(S) | 10ohm,5%,2W,AA,TP,4x12m | ⚠ |
| R615 | 2001-000354 | R-CARBON | 150KOHM,5%,1/4W,AA,TP,2.4X6.4MM | |
| R616 | 2001-000105 | R-CARBON | 1.5KOHM,5%,1/4W,AA,TP,2.4X6.4MM | |
| R617 | 2001-000734 | R-CARBON | 4.7KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R618 | 2001-000857 | R-CARBON | 560OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R619 | 2001-000786 | R-CARBON | 47KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R621 | 2001-000857 | R-CARBON | 560OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R622 | 2001-000734 | R-CARBON | 4.7KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R623 | 2003-000507 | R-METAL OXIDE(S) | 15Kohm,5%,1W,AA,TP,3.3x | |
| R624 | 2001-000786 | R-CARBON | 47KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R625 | 2001-001088 | R-CARBON(S) | 1KOHM,5%,1/2W,AA,TP,2.4X6.4M | |
| RL601 | 3501-001111 | RELAY-POWER | 12Vdc,250mW,5A,1FormA,15mS,5 | ⚠ |
| SW201 | 3404-000244 | SWITCH-TACT | 15V,20mA,90-170gf,7.5x7mm,SP | |
| SW202 | 3404-000244 | SWITCH-TACT | 15V,20mA,90-170gf,7.5x7mm,SP | |
| SW203 | 3404-000244 | SWITCH-TACT | 15V,20mA,90-170gf,7.5x7mm,SP | |
| SW204 | 3404-000244 | SWITCH-TACT | 15V,20mA,90-170gf,7.5x7mm,SP | |
| SW205 | 3404-000244 | SWITCH-TACT | 15V,20mA,90-170gf,7.5x7mm,SP | |
| SW206 | 3404-000244 | SWITCH-TACT | 15V,20mA,90-170gf,7.5x7mm,SP | |
| SW207 | 3404-000244 | SWITCH-TACT | 15V,20mA,90-170gf,7.5x7mm,SP | |
| SW208 | 3404-000244 | SWITCH-TACT | 15V,20mA,90-170gf,7.5x7mm,SP | |
| SW209 | 3404-000244 | SWITCH-TACT | 15V,20mA,90-170gf,7.5x7mm,SP | |
| SW210 | 3404-000244 | SWITCH-TACT | 15V,20mA,90-170gf,7.5x7mm,SP | |
| SW601 | 3403-001050 | SWITCH-PUSH | 30V,0.3A,SPDT,ON-OFF,PC BORD | |
| T401 | BH26-30336A | TRANS-HOR.DRIVE | 9.6MH,6P,EE2017,SB-5S,9 | |
| T501 | BH26-00015A | TRANS-FBT | 1.20MH,12P,FUR3658,SM19C,F | ⚠ |
| T601 | BH26-00024A | TRANS-POWER | 390UH,16P,EER 3541,PL3,PM2,J | ⚠ |
| T602 | BH26-30302S | TRANS-SYNC. | 3-1(250UH),SB-5S,UU1116 | ⚠ |
| TH601 | 1404-000002 | THERMISTOR-PTC | 9ohm,20%,TR,RECT | |
| TH602 | 1404-001020 | THERMISTOR-NTC | 8ohm,15%,17mW/C,BK | |
| VR501 | 2103-000493 | VR-SEMI | 5Kohm,30%,1/10W,SIDE | |
| X201 | 2801-000005 | CRYSTAL-UNIT | 8MHz,50ppm,28-AAM,S,35ohm | |

## 8-2 Video PCB Parts

| Loc. No. | Code No. | Description | Specification | Remarks |
|---|---|---|---|---|
| BD101 | 3301-000011 | CORE-FERRITE BEAD | AA,3.5x1.0x5.7mm,1500 | |
| BD102 | 3301-000011 | CORE-FERRITE BEAD | AA,3.5x1.0x5.7mm,1500 | |
| BD104 | 3301-000011 | CORE-FERRITE BEAD | AA,3.5x1.0x5.7mm,1500 | |
| BD105 | 3301-000011 | CORE-FERRITE BEAD | AA,3.5x1.0x5.7mm,1500 | |
| C101B | 2401-000028 | C-AL | 10uF,20%,50V,GP,TP,5x11,5 | |
| C101G | 2401-000028 | C-AL | 10uF,20%,50V,GP,TP,5x11,5 | |
| C101R | 2401-000028 | C-AL | 10uF,20%,50V,GP,TP,5x11,5 | |
| C103B | 2301-000010 | C-FILM,PEF | 100nF,5%,100V,TP,11.5x12.5mm | |
| C103G | 2301-000010 | C-FILM,PEF | 100nF,5%,100V,TP,11.5x12.5mm | |
| C103R | 2301-000010 | C-FILM,PEF | 100nF,5%,100V,TP,11.5x12.5mm | |
| C104B | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5 | |
| C104G | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5 | |
| C104R | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5 | |
| C106B | 2401-000043 | C-AL | 1uF,20%,160V,GP,TP,6.3x11,5 | |
| C106G | 2401-000043 | C-AL | 1uF,20%,160V,GP,TP,6.3x11,5 | |
| C106R | 2401-000043 | C-AL | 1uF,20%,160V,GP,TP,6.3x11,5 | |
| C107 | 2301-000010 | C-FILM,PEF | 100nF,5%,100V,TP,11.5x12.5mm | |
| C110 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5 | |
| C111 | 2401-000042 | C-AL | 100uF,20%,16V,GP,TP,6.3x7,5 | |
| C112 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5 | |
| C113 | 2401-000033 | C-AL | 100uF,20%,100V,GP,TP,12.5x20,5 | |
| C114 | 2401-000043 | C-AL | 1uF,20%,160V,GP,TP,6.3x11,5 | |
| C115 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5 | |
| C116 | 2401-000042 | C-AL | 100uF,20%,16V,GP,TP,6.3x7,5 | |
| C117 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5 | |
| C118 | 2201-000154 | C-CERAMIC,DISC | 10nF,+80-20%,2KV,Y5P,TP,2 | |
| C119 | 2201-000291 | C-CERAMIC,DISC | 1nF,10%,500V,Y5P,TP,8.5x5 | |
| C120 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5 | |
| C121 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5 | |
| C123 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5 | |
| C124 | 2401-000042 | C-AL | 100uF,20%,16V,GP,TP,6.3x7,5 | |
| C125 | 2201-000021 | C-CERAMIC,DISC | 100nF,+80-20%,50V,Y5V,TP | |
| C126 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5 | |
| C127 | 2401-000603 | C-AL | 1uF,20%,50V,GP,TP,5x11,5 | |
| CN102 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| CN103 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| CN105 | BH39-00026A | CBF-HARNESS | 11P/11P,180MM,BLU/RED/GRY/WH | |
| CN202_2 | 3711-004228 | CONNECTOR-HEADER | BOX,6P,1R,2MM,ANGLE,SN | |
| D101B | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D101G | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D101R | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D102B | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D102G | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D102R | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D103B | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D103G | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |
| D103R | 0401-000005 | DIODE-SWITCHING | 1N4148,75V,200MA,DO-35,T | |

| Loc. No. | Code No. | Description | Specification | Remarks |
|---|---|---|---|---|
| IC101 | 1201-001315 | IC-VIDEO AMP | 2504,DIP,24P,300MIL,SINGLE | ⚠ |
| IC103 | BH13-00007A | IC-HYBRID | COLOR MONITOR,LM2439,TO-220-9L | ⚠ |
| L101B | 2701-001036 | INDUCTOR-AXIAL | 1.2uH,10%,4.2x9.8mm | |
| L101G | 2701-001036 | INDUCTOR-AXIAL | 1.2uH,10%,4.2x9.8mm | |
| L101R | 2701-001036 | INDUCTOR-AXIAL | 1.2uH,10%,4.2x9.8mm | |
| Q101B | 0501-000140 | TR-SMALL SIGNAL | 2N5551,NPN,625mW,TO-92 | |
| Q101G | 0501-000140 | TR-SMALL SIGNAL | 2N5551,NPN,625mW,TO-92 | |
| Q101R | 0501-000140 | TR-SMALL SIGNAL | 2N5551,NPN,625mW,TO-92 | |
| Q102B | 0501-000138 | TR-SMALL SIGNAL | 2N5401,PNP,625mW,TO-92,T | |
| Q102G | 0501-000138 | TR-SMALL SIGNAL | 2N5401,PNP,625mW,TO-92,T | |
| Q102R | 0501-000138 | TR-SMALL SIGNAL | 2N5401,PNP,625mW,TO-92,T | |
| R102B | 2001-000666 | R-CARBON | 33OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R102G | 2001-000666 | R-CARBON | 33OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R102R | 2001-000666 | R-CARBON | 33OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R103B | 2001-000969 | R-CARBON | 75OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R103G | 2001-000969 | R-CARBON | 75OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R103R | 2001-000969 | R-CARBON | 75OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R104B | 2001-000021 | R-CARBON | 27OHM,5%,1/4W,AA,TP,2.4X6.4MM | |
| R104G | 2001-000021 | R-CARBON | 27OHM,5%,1/4W,AA,TP,2.4X6.4MM | |
| R104R | 2001-000021 | R-CARBON | 27OHM,5%,1/4W,AA,TP,2.4X6.4MM | |
| R105B | 2001-000011 | R-CARBON | 75KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R105G | 2001-000011 | R-CARBON | 75KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R105R | 2001-000011 | R-CARBON | 75KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R106 | 2001-000042 | R-CARBON | 1KOHM,5%,1/4W,AA,TP,2.4X6.4MM | |
| R107B | 2001-001070 | R-CARBON(S) | 120OHM,5%,1/2W,AA,TP,2.4X6.4 | |
| R107G | 2001-001070 | R-CARBON(S) | 120OHM,5%,1/2W,AA,TP,2.4X6.4 | |
| R107R | 2001-001070 | R-CARBON(S) | 120OHM,5%,1/2W,AA,TP,2.4X6.4 | |
| R108B | 2001-000531 | R-CARBON | 240KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R108G | 2001-000531 | R-CARBON | 240KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R108R | 2001-000531 | R-CARBON | 240KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R110 | 2001-000869 | R-CARBON | 56OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R110B | 2001-000449 | R-CARBON | 2.2KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R110G | 2001-000449 | R-CARBON | 2.2KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R110R | 2001-000449 | R-CARBON | 2.2KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R111 | 2001-000869 | R-CARBON | 56OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R112 | 2001-000835 | R-CARBON | 51KOHM,5%,1/4W,AA,TP,2.4X6.4MM | |
| R113B | 2001-000281 | R-CARBON | 100OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R113G | 2001-000281 | R-CARBON | 100OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R113R | 2001-000281 | R-CARBON | 100OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R114 | 2001-000511 | R-CARBON | 220OHM,5%,1/2W,AA,TP,3.3X9MM | |
| R115 | 2001-000281 | R-CARBON | 100OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R116 | 2001-000281 | R-CARBON | 100OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R117 | 2001-000005 | R-CARBON | 390OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R118 | 2001-000005 | R-CARBON | 390OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R119 | 2001-000005 | R-CARBON | 390OHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| R627 | 2001-000613 | R-CARBON | 3.9KOHM,5%,1/8W,AA,TP,1.8X3.2MM | |
| S/VID | 6502-000001 | CABLE CLAMP | DAWH-5NB,D15,L35,NTR,NYLON66 | |

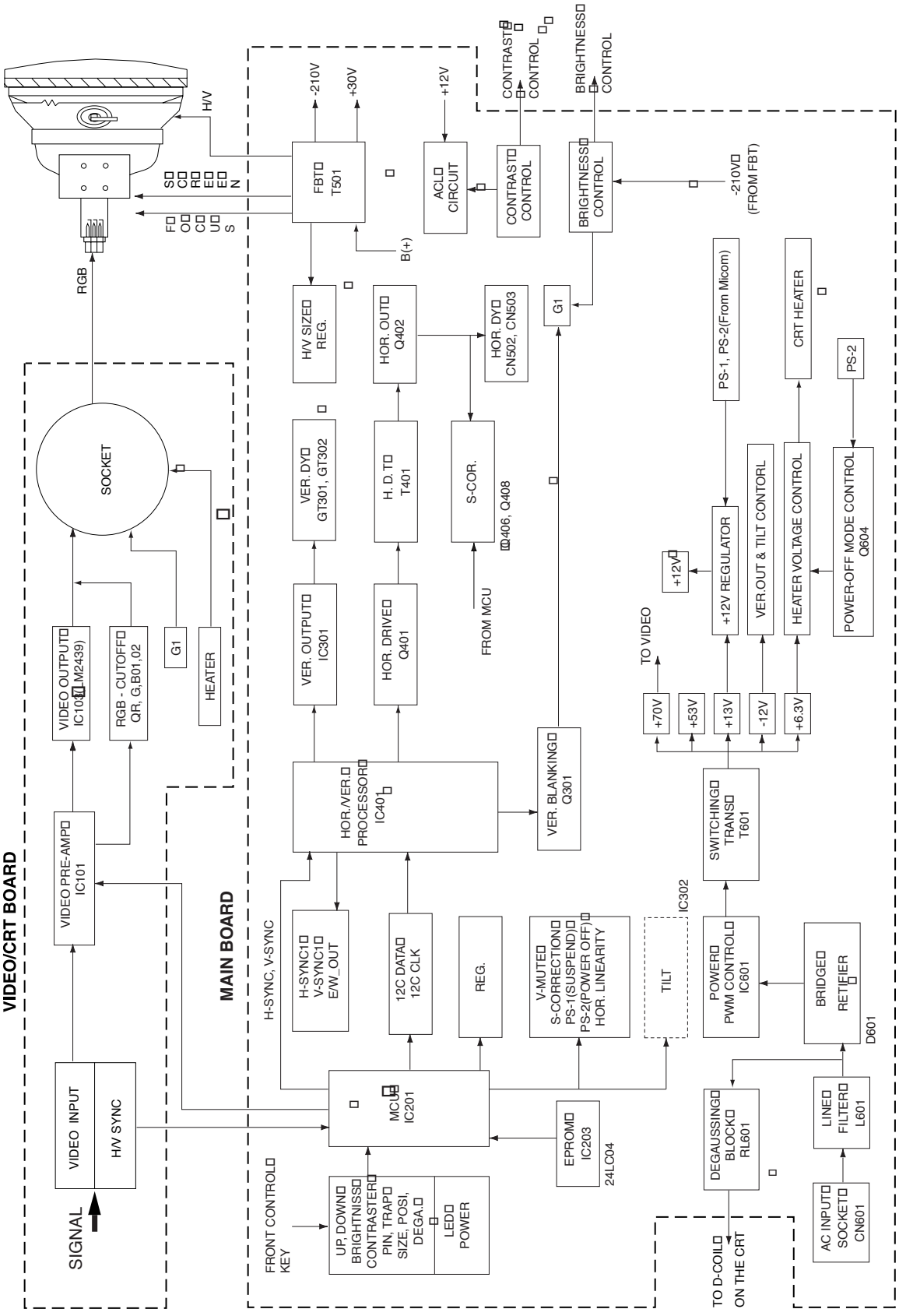
| Loc. No. | Code No. | Description | Specification | Remarks |
|---|---|---|---|---|
| SK101 | 4715-000001 | SURGE ABSORBER | 1KV,+50-10% | |
| SK102 | 1405-001064 | SURGE ABSORBER | 400V,20%,AXIAL | |
| SK103 | 3704-001014 | SOCKET-CRT | 12P,22.5PI,26.5PI,SN | |

## Others

| Loc. No. | Code No. | Description | Specification | Remarks |
|---|---|---|---|---|
| ⚠ CRT | BH03-10337W | CRT-COLOR | 15,0.28,M36KUK35X02(E/LP),SING | DP15LS/LT |
| | BH03-10338J | CRT-COLOR | 14,0.28,M34QBH351X122,SINGLE | DP14LS/LT |
| MAGNET | 3302-000006 | MAGNET-RUBBER | AF,14G,1620-1980G,0.58-0.9 | |
| ASS'Y PBA UNIT | BH94-00045B | ASSY,PCB | DP15LS/LT | |
| | BH94-00045C | ASSY,PCB | DP14LS/LT | |
| B/D ASS'Y | BH98-00035B | ASSY,PCB/MAIN | DP15LS/LT | |
| | BH98-00035C | ASSY,PCB/MAIN | DP14LS/LT | |
| | BH98-00041C | ASSY,PCB/VIDEO | DP15LS/LT,DP14LS | |
| | BH98-00041B | ASSY,PCB/VIDEO | DP15LS/LT | |
| D/COIL | BH27-00009A | COIL-DEGAUSSING | 300*240*1060MM,7.2MH,22. | 15" |
| | BH27-00011A | COIL-DEGAUSSING | 240*215*900MM,6.0MH,18.8 | 14" |
| CRT-GND | BH39-00017A | CBF-HARNESS | 1P,320MM,BLK,UL1015/3*0.16TA | DP15LS/LT |
| | BH39-00030A | CBF-HARNESS | 285MM,BLK,UL1015,AWG18,YFH | DP14LS/LT |
| SIGNAL-CABLE | BH39-00022A | CBF-SIGNAL | ATT,1200MM,15P/16P,7P,IVORY | 14" |
| SIGNAL-CABLE | BH39-00023A | CBF-SIGNAL | ATT,1500MM,15P/6P,7P,IVORY | 15" |
| WIRE-GND | BH39-00025A | CBF-HARNESS | 150MM,BLK,UL1015,AWG18,350 | 14" |
| WIRE-GND | BH39-00024A | CBF-HARNESS | 200MM,BLK,UL1015,AWG18,350 | 14" |
| P/CORD | BH39-10007A | CBF POWER/CORD | DET,H05VV-F,250V/6A,IVY,1830MM | |
| | BH39-10339E | CBF POWER/CORD | DET,SVT,125V 7A/10A,IVY,1830MM | |

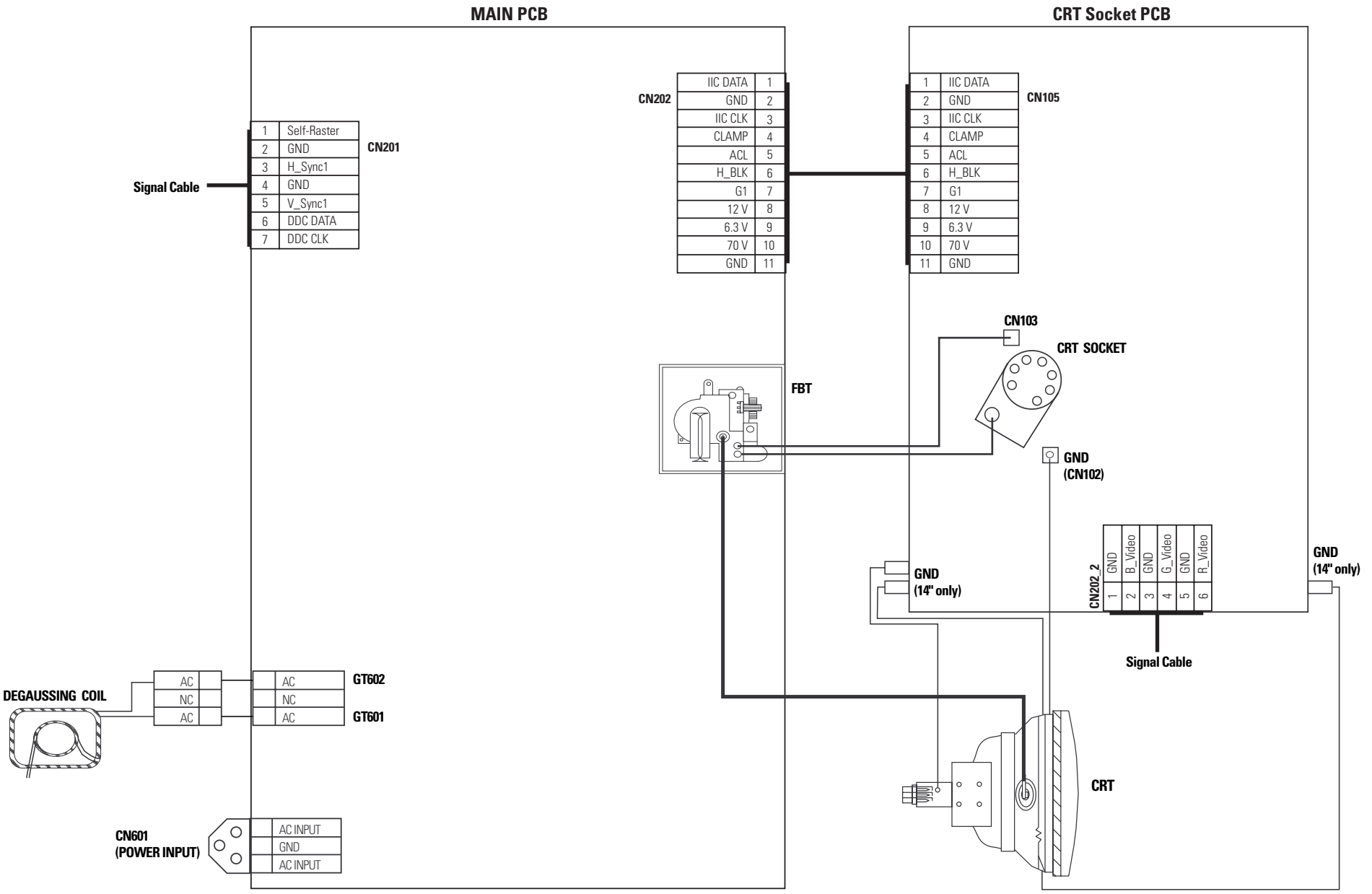
**Memo**

# 9 Block Diagrams



# Memo

# 10 Wiring Diagram



# 11 Schematic Diagrams

## 11-1 Power Part Schematic Diagram

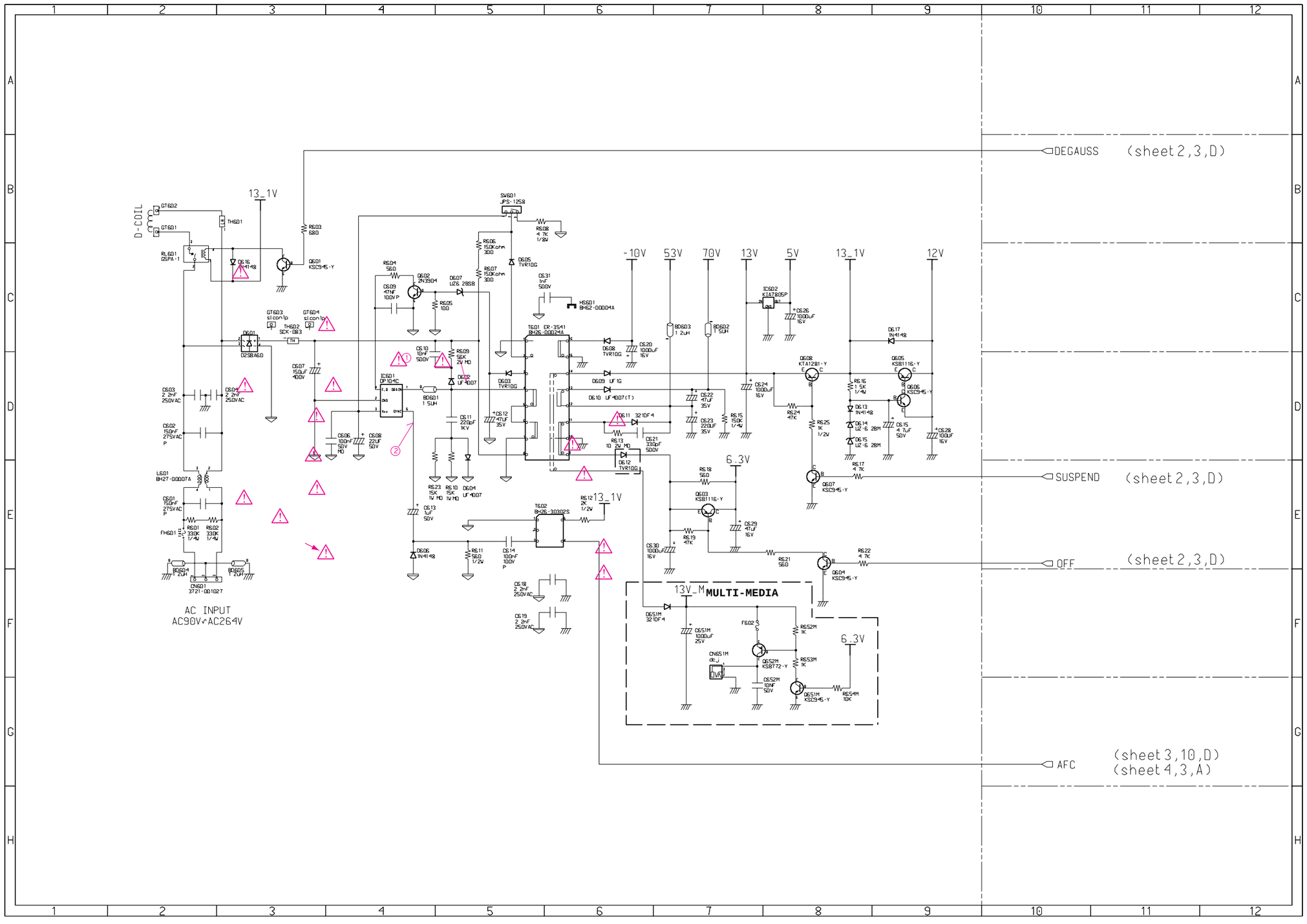


**Table 11-1. IC601 (DP104C)**

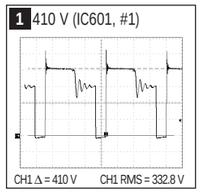
| pin # | MODES | |
|---|---|---|
| | 800 x 600 / 85 Hz | 640 x 480 / 60 Hz |
| 1 | 325.2 | 321.6 |
| 2 | GND | GND |
| 3 | 20.66 | 20.38 |
| 4 | 1.55 | 1.876 |
| 5 | 5.156 | 5.12 |

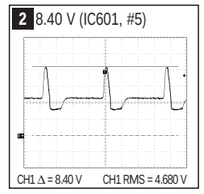
**Unit: Vrms**

**Table 11-2. IC602 (KIA7805P)**

| pin # | MODES | |
|---|---|---|
| | 800 x 600 / 85 Hz | 640 x 480 / 60 Hz |
| 1 | 13.55 | 13.48 |
| 2 | GND | GND |
| 3 | 5.15 | 5.15 |

**Unit: Vrms**



## 11-2 Micom Part Schematic Diagram

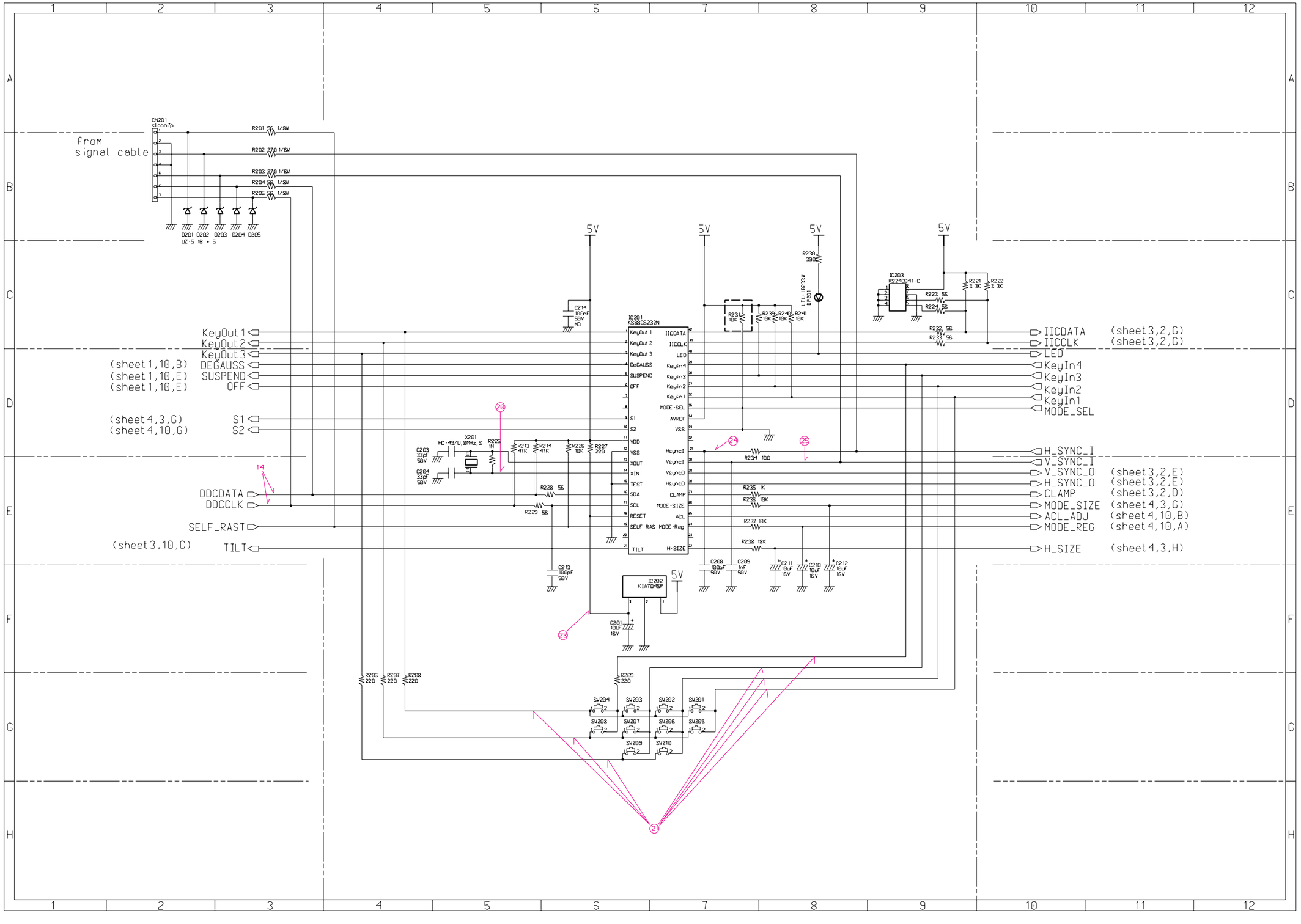


**Table 11-3. IC201 (DM104)**

| pin # | MODES | | pin # | MODES | |
|---|---|---|---|---|---|
| | 800 x 600 / 85 Hz | 640 x 480 / 60 Hz | | 800 x 600 / 85 Hz | 640 x 480 / 60 Hz |
| 1 | – | – | 22 | 2.732 | 2.732 |
| 2 | 0 | 0 | 23 | – | – |
| 3 | 0 | 0 | 24 | – | – |
| 4 | 0 | 0 | 25 | 2.98 | 2.98 |
| 5 | 0 | 0 | 26 | 3.76 | 3.76 |
| 6 | 4.92 | 4.92 | 27 | 5.02 | 5.06 |
| 7 | – | – | 28 | 1.236 | 1.716 |
| 8 | – | – | 29 | 1.066 | 1.132 |
| 9 | 5.092 | 5.092 | 30 | 1.12 | 4.62 |
| 10 | 5.092 | 5.092 | 31 | 1.2 | 4.8 |
| 11 | 5.124 | 5.124 | 32 | – | – |
| 12 | GND | GND | 33 | GND | GND |
| 13 | 3.212 | 3.212 | 34 | 5.08 | 5.08 |
| 14 | 2.952 | 2.952 | 35 | 5.1 | 5.12 |
| 15 | GND | GND | 36 | 5.108 | 5.108 |
| 16 | 2.1 | 2.1 | 37 | 5.1 | 5.1 |
| 17 | 3.546 | 3.546 | 38 | 5.1 | 5.1 |
| 18 | 5.08 | 5.08 | 39 | 5.1 | 5.1 |
| 19 | 0 | 0 | 40 | 0 | 0 |
| 20 | – | – | 41 | 5.116 | 5.116 |
| 21 | 3.644 | 3.644 | 42 | 5.116 | 5.116 |

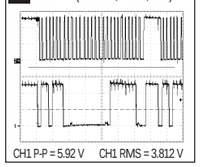
**Unit: Vrms**

**Table 11-4. IC203 (KS24C04)**

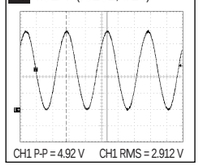
| pin # | MODES | |
|---|---|---|
| | 800 x 600 / 85 Hz | 640 x 480 / 60 Hz |
| 1 | GND | GND |
| 2 | GND | GND |
| 3 | GND | GND |
| 4 | GND | GND |
| 5 | 4.16 | 4.16 |
| 6 | 3.92 | 3.92 |
| 7 | GND | GND |
| 8 | 5.12 | 5.12 |

**Unit: Vrms**

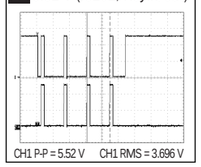
**14** 5.92 V (IC201, #16, 17)



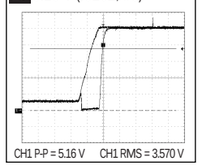

**20** 4.92 V (IC201, #14)



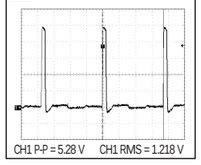

**21** 5.52 V (IC201, Keyin/out)



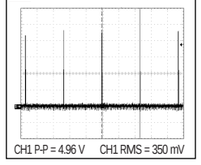

**23** 5.16 V (IC202, #3)




**24** 5.28 V (IC201, #31)




**25** 4.96 V (IC201, #30)



## 11-3 HOR./VER. Part Schematic Diagram

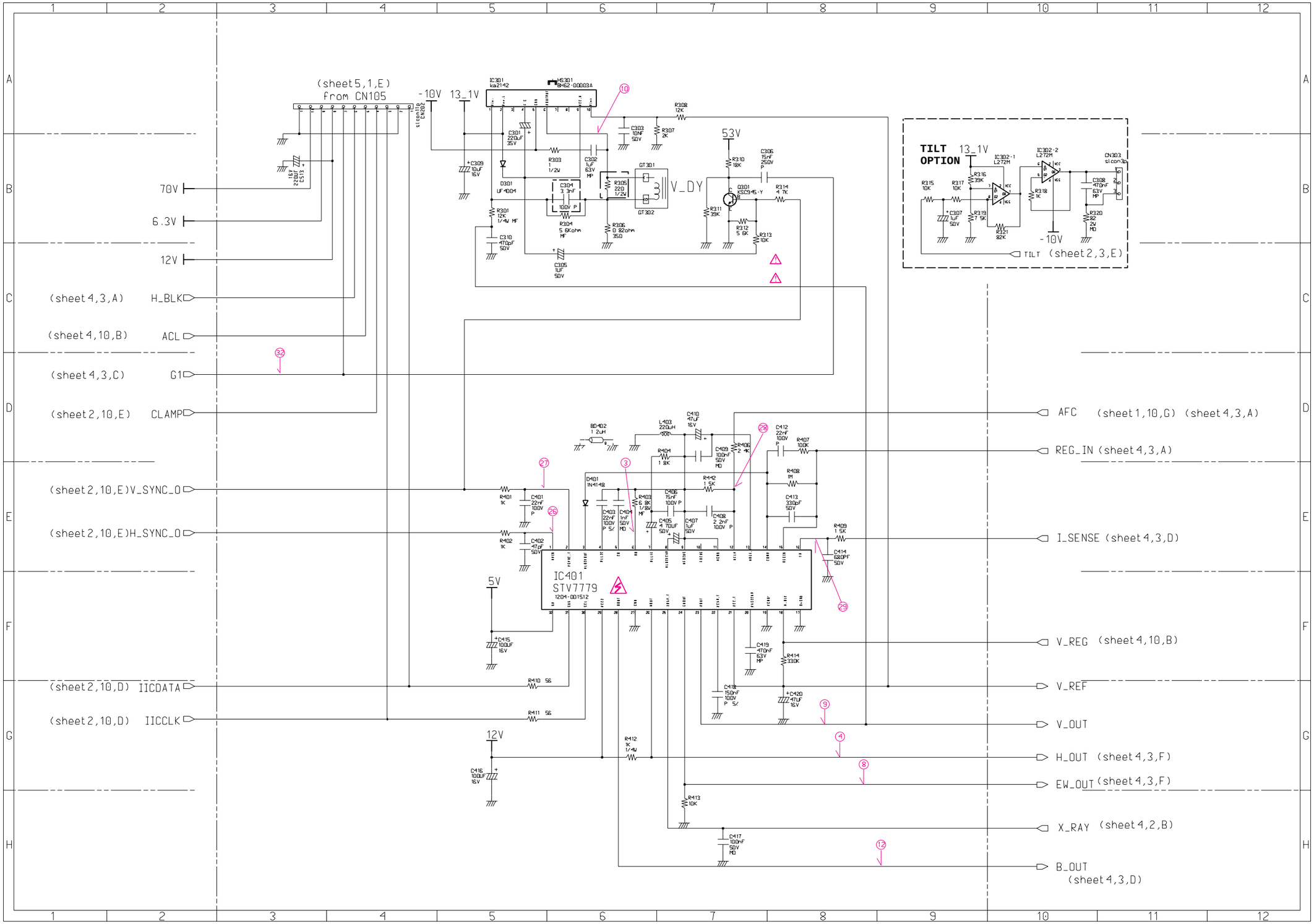


**Table 11-5. IC301 (KA2142)**

| pin # | MODES | |
|---|---|---|
| | 800 x 600 / 85 Hz | 640 x 480 / 60 Hz |
| 1 | 1.21 | 1.21 |
| 2 | 13.52 | 13.45 |
| 3 | – | – |
| 4 | 11.25 | 11.21 |
| 5 | 10.97 | 10.97 |
| 6 | 18.04 | 18.6 |
| 7 | – | – |
| 8 | – | – |
| 9 | 13.2 | 13.2 |
| 10 | 1.52 | 1.52 |

**Unit: Vrms**

**Table 11-6. IC302 (LM272)**

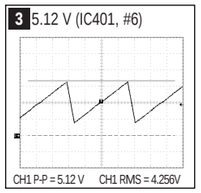
| pin # | MODES | |
|---|---|---|
| | 800 x 600 / 85 Hz | 640 x 480 / 60 Hz |
| 1 | 100 mV | 0 |
| 2 | 13.4 | 13.4 |
| 3 | 100 mV | 0 |
| 4 | 10.8 | 10.8 |
| 5 | 100 mV | 0 |
| 6 | 100 mV | 0 |
| 7 | 2.2 | 2.2 |
| 8 | 2.2 | 2.2 |

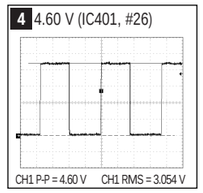
**Unit: Vrms**

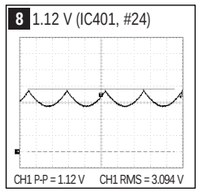
**Table 11-7. IC401 (STV7779)**

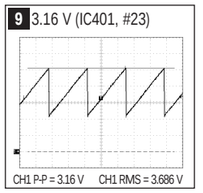
| pin # | MODES | | pin # | MODES | |
|---|---|---|---|---|---|
| | 800 x 600 / 85 Hz | 640 x 480 / 60 Hz | | 800 x 600 / 85 Hz | 640 x 480 / 60 Hz |
| 1 | 1.23 | 1.71 | 17 | GND | GND |
| 2 | 0 | 0 | 18 | 6.89 | 6.89 |
| 3 | 5.15 | 5.15 | 19 | GND | GND |
| 4 | 2.5 | 3.04 | 20 | 5.22 | 5.43 |
| 5 | 4.31 | 4.31 | 21 | 8.12 | 8.12 |
| 6 | 4.58 | 2.78 | 22 | 3.05 | 3.05 |
| 7 | 4.59 | 2.78 | 23 | 3.58 | 3.58 |
| 8 | 3.25 | 3.41 | 24 | 3 | 2.9 |
| 9 | GND | GND | 25 | 2.03 | 2.77 |
| 10 | – | – | 26 | 2.98 | 3.25 |
| 11 | 0 | 0 | 27 | GND | GND |
| 12 | 410 mV | 500 mV | 28 | 7.19 | 4.7 |
| 13 | 8 | 8 | 29 | 12.22 | 12.22 |
| 14 | 3.59 | 2.9 | 30 | 4 | 3.85 |
| 15 | 4.74 | 4.8 | 31 | 4.15 | 4.15 |
| 16 | 0 | 160 mV | 32 | 5.16 | 5.16 |

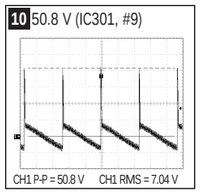
**Unit: Vrms**

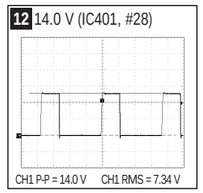


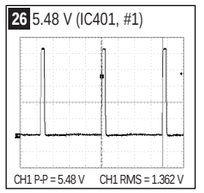



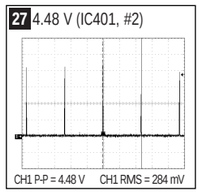



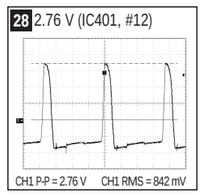



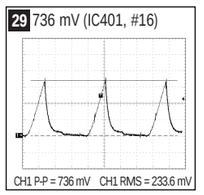



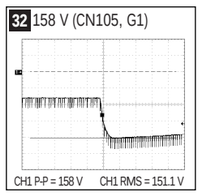



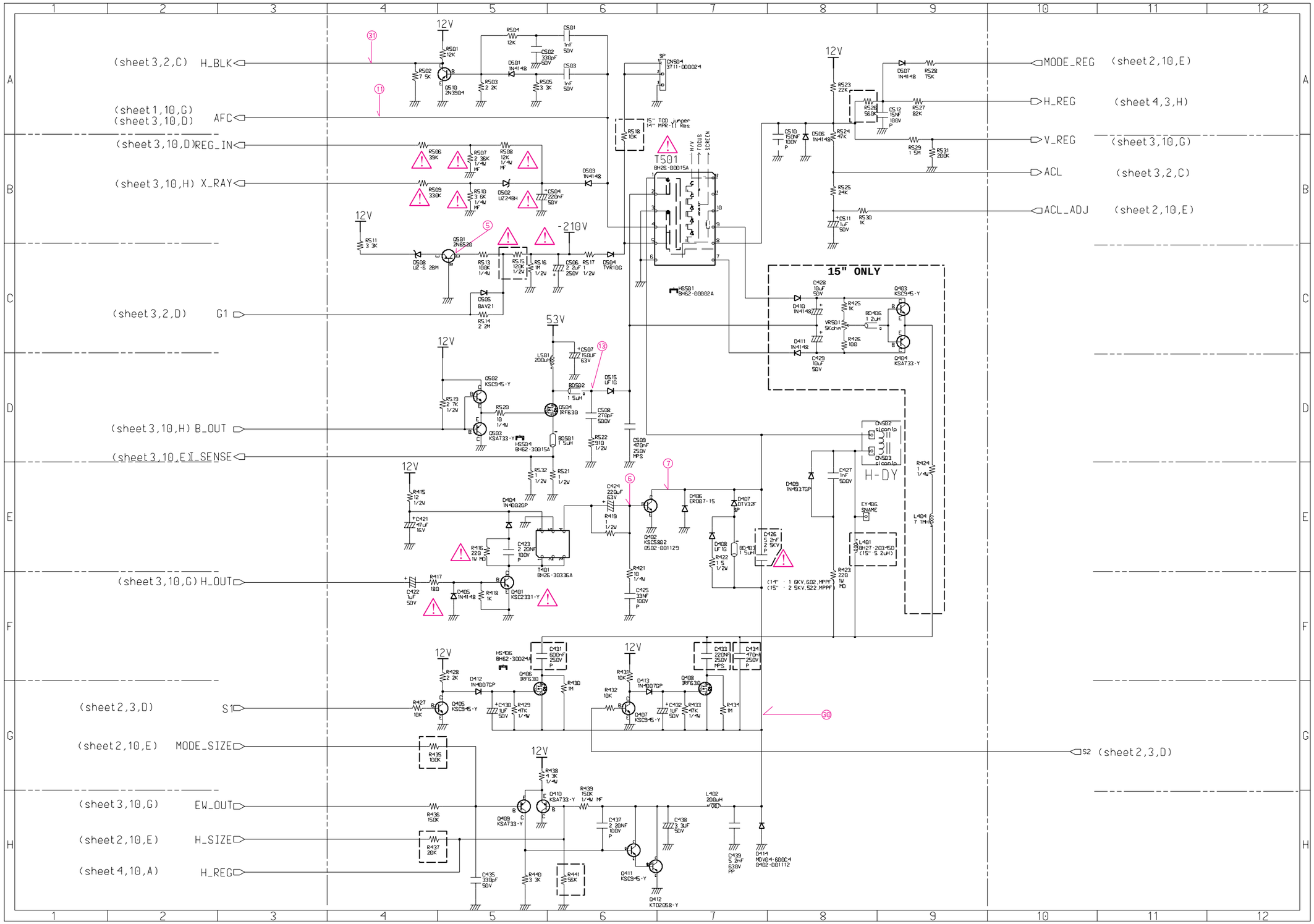



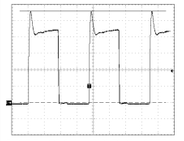



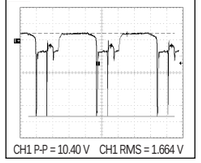
## 11-4 H_OUT Part Schematic Diagram



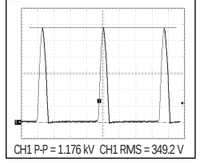
**5** 28.4 V (Q501, Collector)



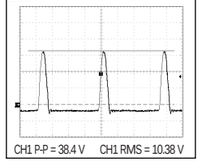

**6** 10.40 V (Q402, Base)



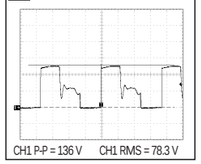

**7** 1.176 kV (Q402, Collector)



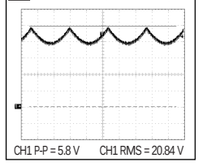

**11** 38.4 V (T501, #4)



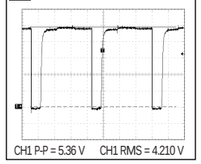

**13** 136 V (Q504, Drain)




**30** 5.8 V (Q412, Collector)




**31** 5.36 V (Q510, Collector)



## 11-5 Video Part Schematic Diagram

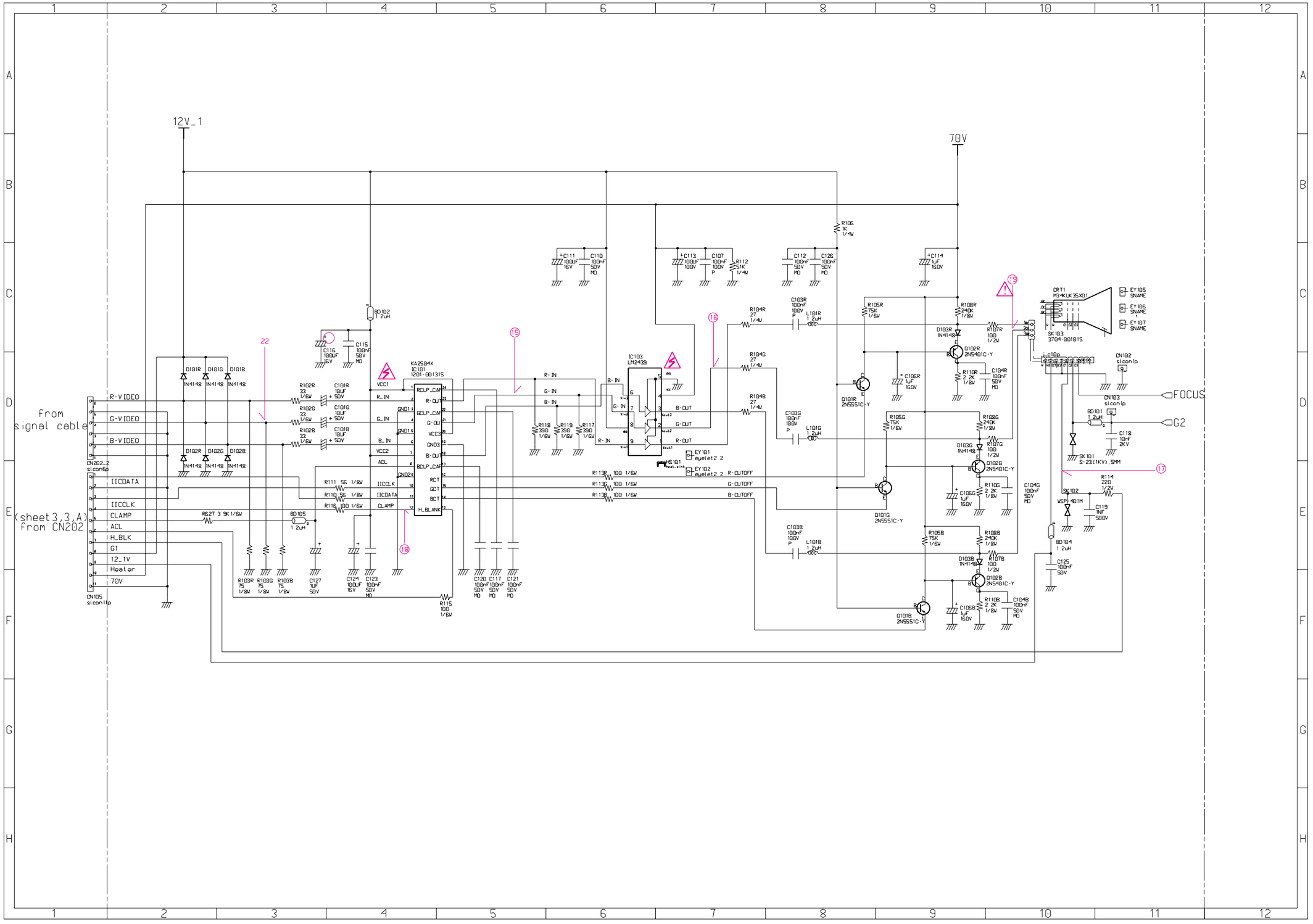


**Table 11-8. IC101 (KA2504)**

| pin # | MODES | | pin # | MODES | |
|---|---|---|---|---|---|
| | 800 x 600 / 85 Hz | 640 x 480 / 60 Hz | | 800 x 600 / 85 Hz | 640 x 480 / 60 Hz |
| 1 | 11.6 | 11.6 | 13 | 4.4 | 4.4 |
| 2 | 800 mV | 800 mV | 14 | 11.2 | 11.2 |
| 3 | GND | GND | 15 | 11.2 | 11.2 |
| 4 | 800 mV | 800 mV | 16 | 11.2 | 11.2 |
| 5 | GND | GND | 17 | 4.2 | 4.2 |
| 6 | 800 mV | 800 mV | 18 | 1.2 | 1.2 |
| 7 | 11.6 | 11.6 | 19 | GND | GND |
| 8 | 3.6 | 3.6 | 20 | 11.6 | 11.6 |
| 9 | GND | GND | 21 | 1.2 | 1.2 |
| 10 | 5.8 | 5.8 | 22 | 4.0 | 4.0 |
| 11 | 5.8 | 5.8 | 23 | 1.4 | 1.4 |
| 12 | 5.8 | 5.8 | 24 | 4.2 | 4.2 |

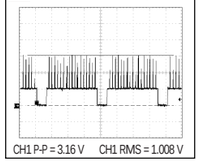
**Unit: Vrms**

**Table 11-9. IC103 (LM2439)**

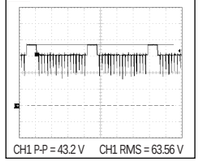
| pin # | MODES | |
|---|---|---|
| | 800 x 600 / 85 Hz | 640 x 480 / 60 Hz |
| 1 | 45.4 | 44.6 |
| 2 | 45.4 | 44.2 |
| 3 | 45.0 | 44.0 |
| 4 | 71.0 | 71.0 |
| 5 | GND | GND |
| 6 | 1.2 | 1.2 |
| 7 | 1.2 | 1.2 |
| 8 | 11.8 | 11.8 |
| 9 | 1.2 | 1.2 |

**Unit: Vrms**

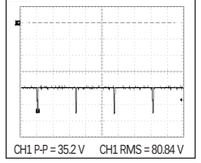
**15** 3.16 V (IC101, #21)



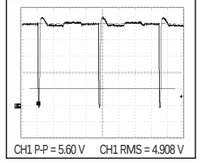

**16** 43.2 V (IC103, #3)



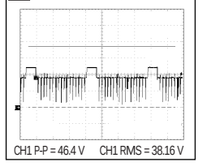

**17** 35.2 V (SK103, G1)



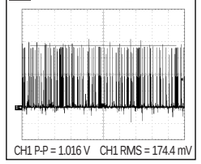

**18** 5.60 V (IC101, #12)




**19** 46.4 V (SK103, G)




**22** 1.016 V (CN202_2, #2,4,6)



## Memo